

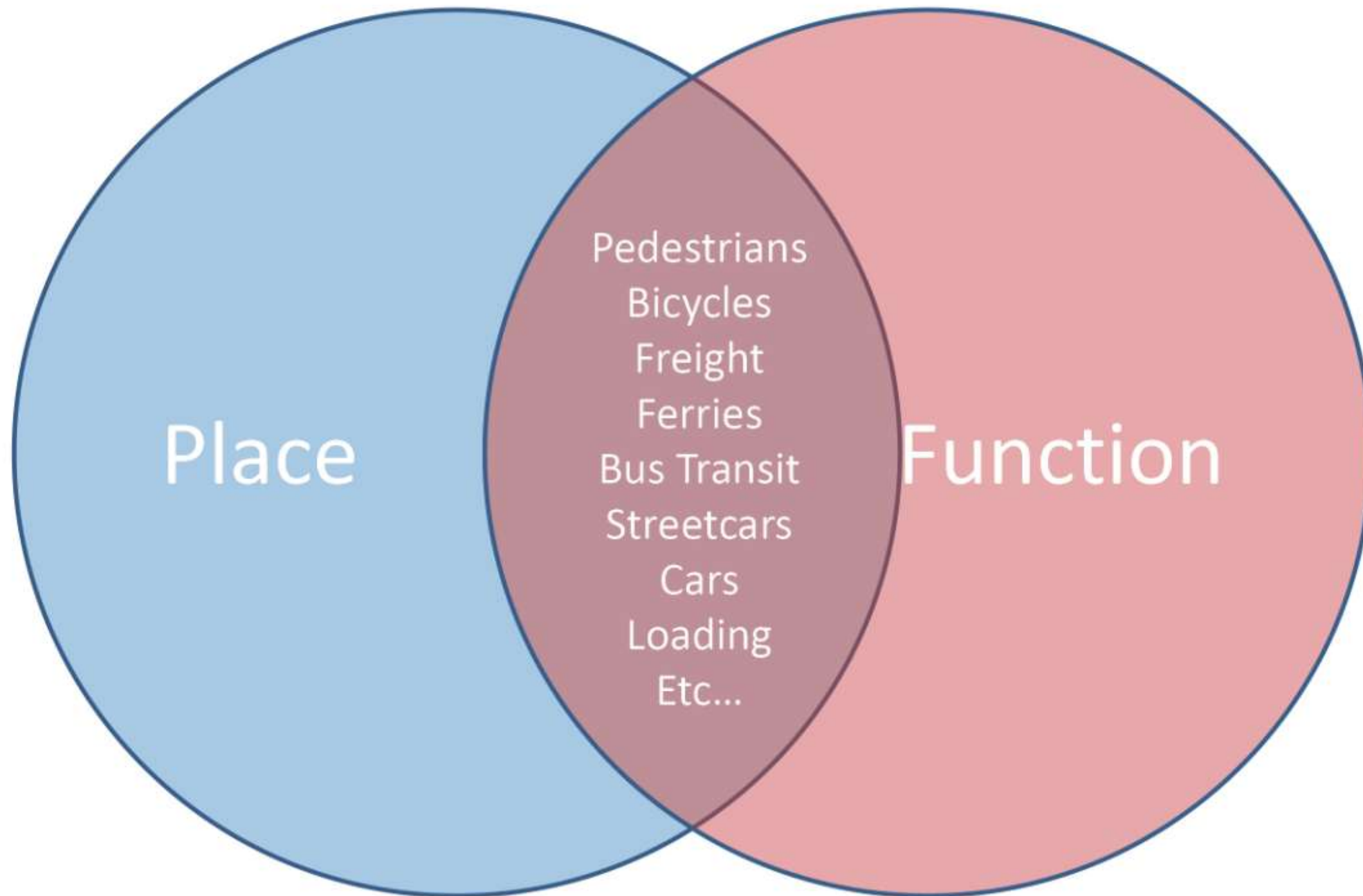


Waterfront Seattle Freight Advisory Board April 16, 2013

A GREAT URBAN STREET



A GREAT URBAN STREET



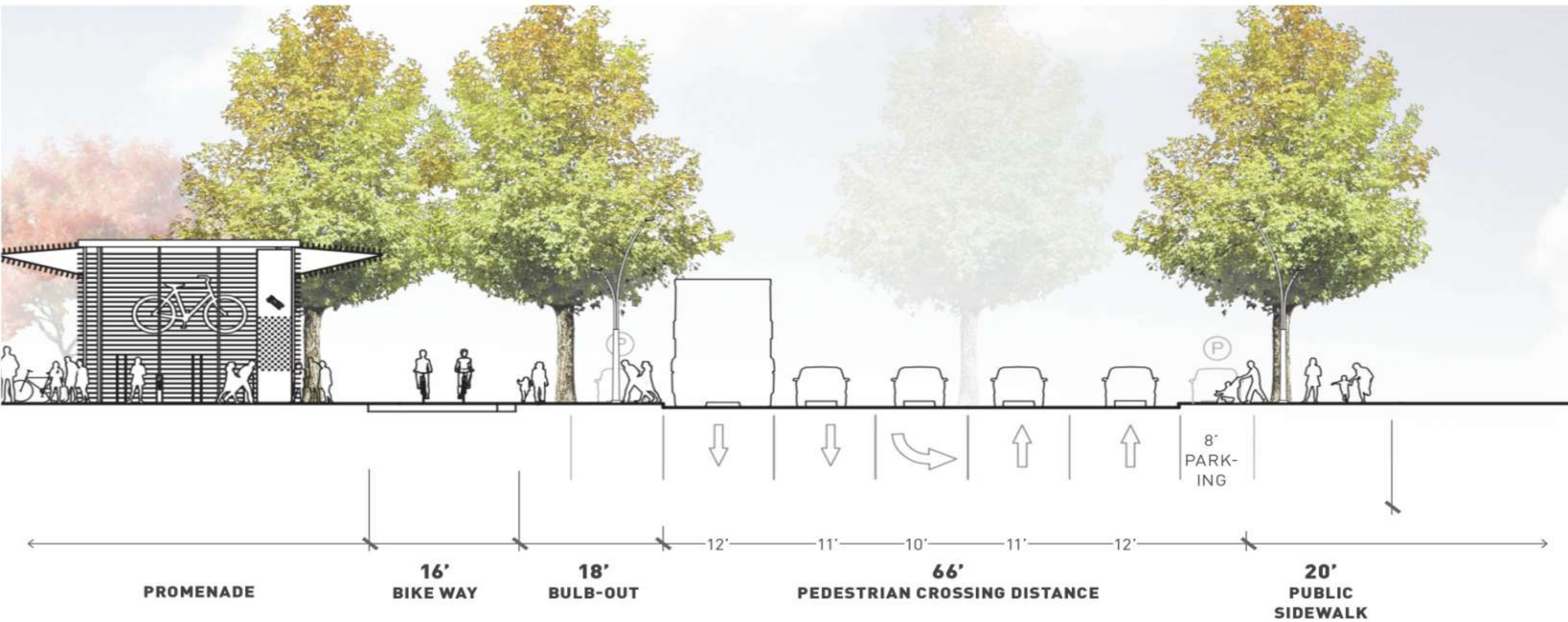
DESIGN PRIORITIES:

- **PUBLIC SPACE**
- **PEDESTRIANS**
- **BICYCLES**
- **TRANSIT (SOUTHWEST SEATTLE AND LOCAL)**
- **FREIGHT**
- **PARKING/LOADING**
- **FERRY ACCESS**
- **ACCESS TO DOWNTOWN AND NW SEATTLE NOT PROVIDED BY BORED TUNNEL**

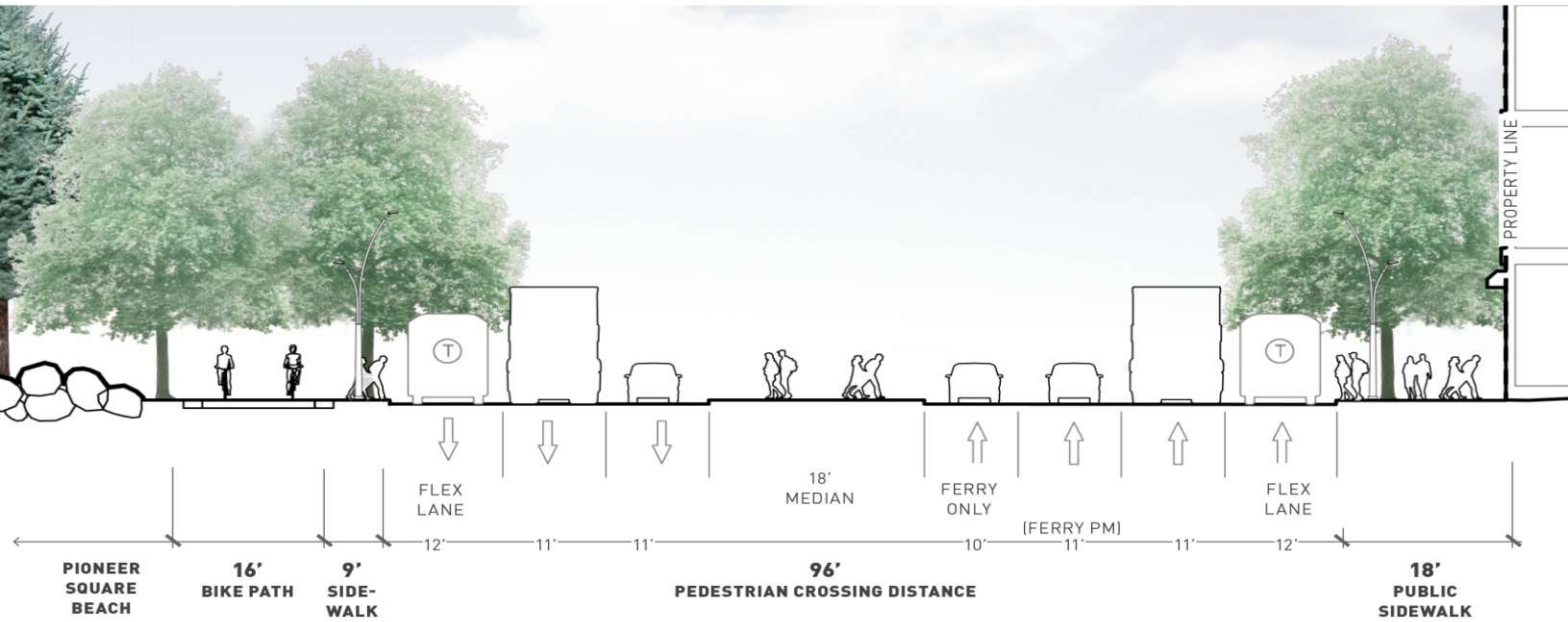
Waterfront Streets



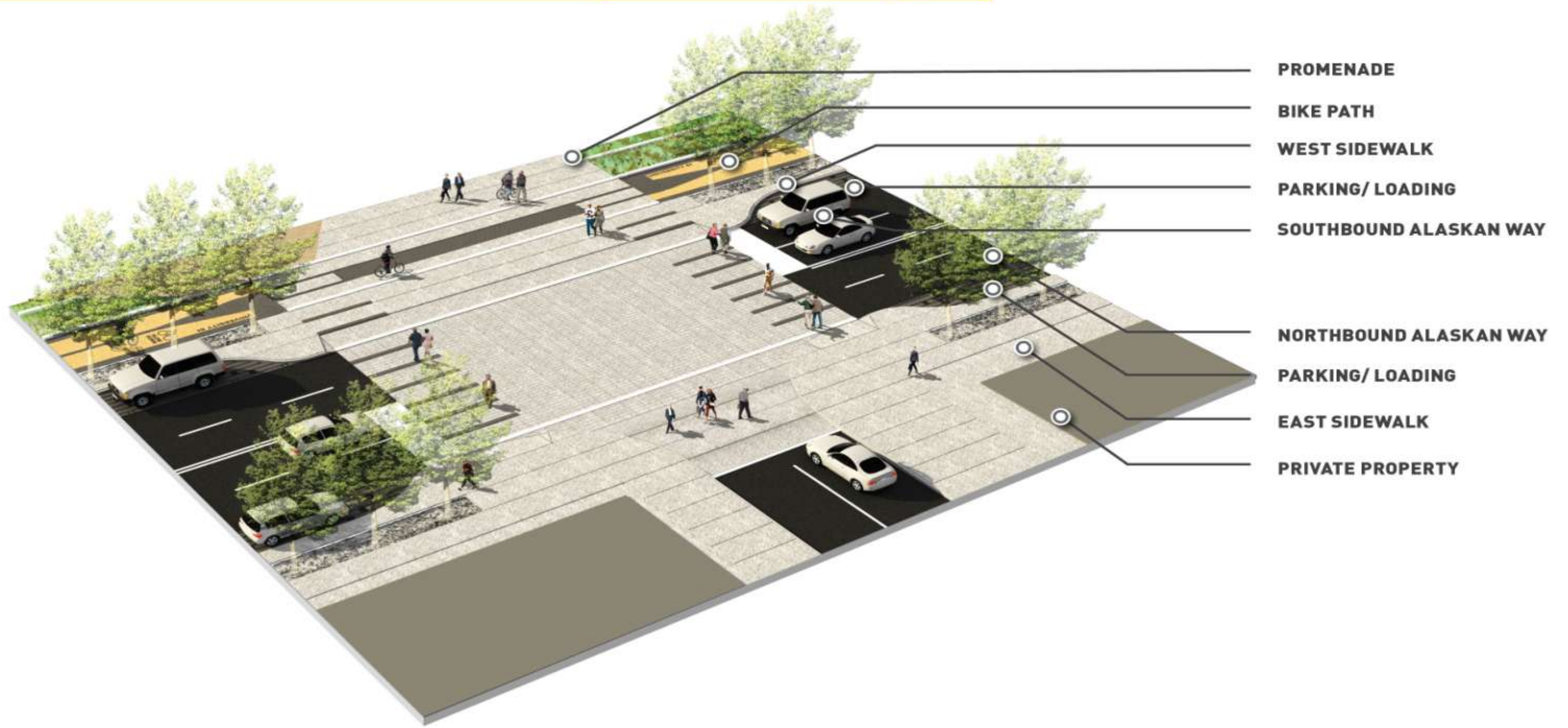
C: Alaskan Way at Spring Street



A: Alaskan Way at S. Main Street



Pedestrian-Friendly Crossings



Promenade at Colman Dock



Promenade at Historic Piers



Historic Piers

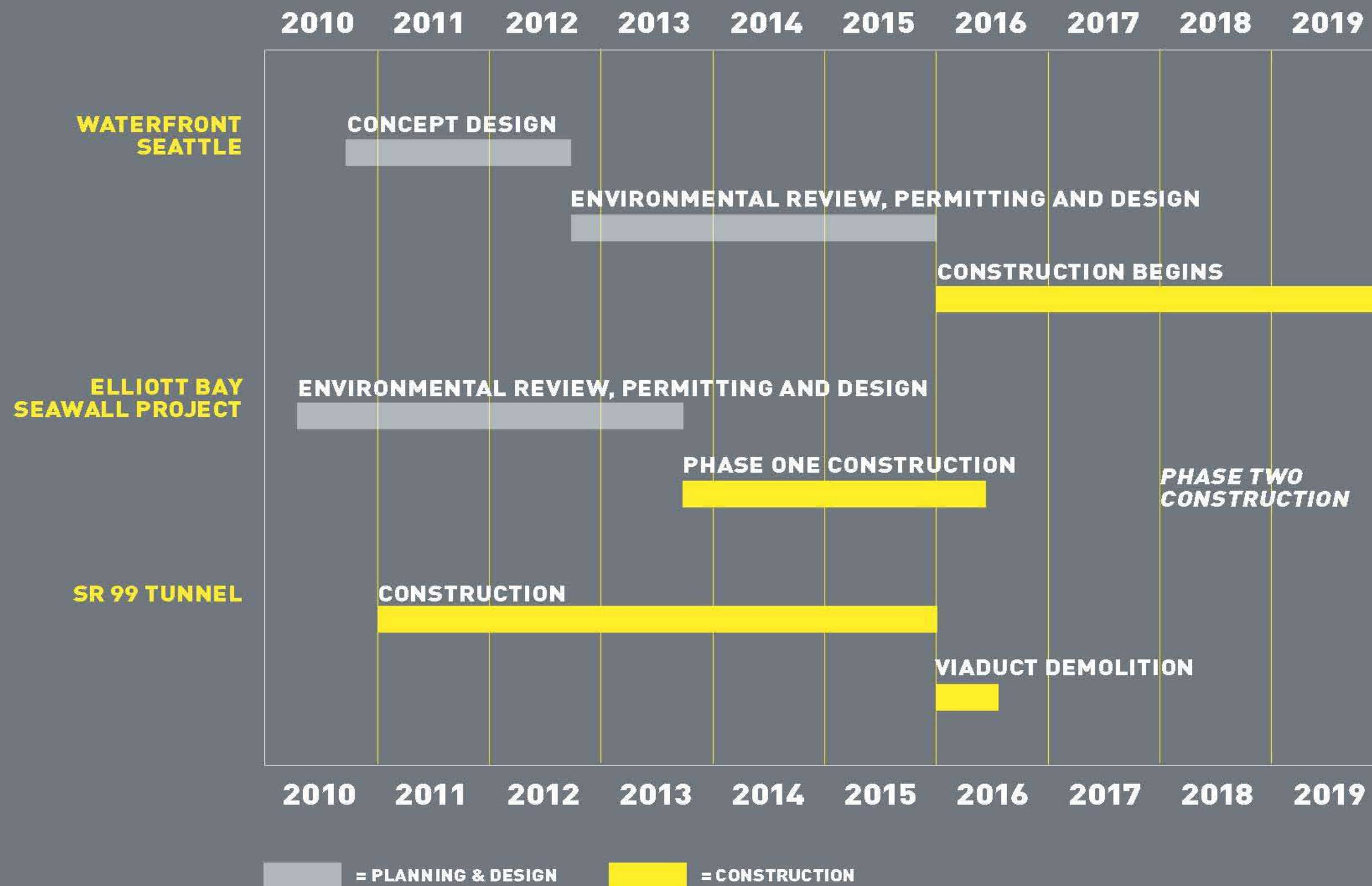


Revitalized Street Frontages









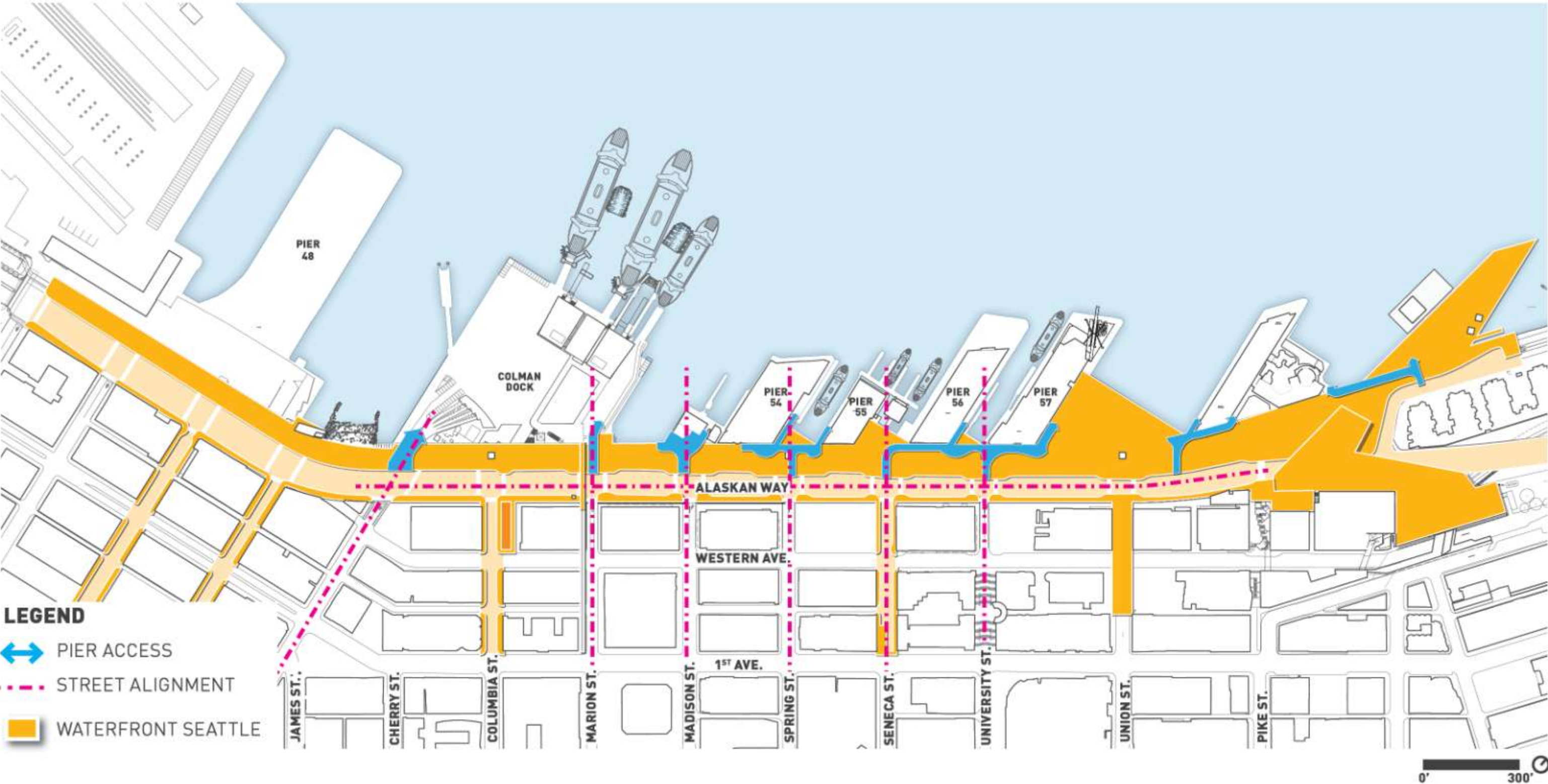
REMAINING STREET AND TRANSIT ISSUES:

- **PIER ACCESS/DRIVEWAYS**
- **BICYCLE FACILITY**
- **SOUTHWEST TRANSIT PATHWAY**
- **LOCAL WATERFRONT TRANSIT**

PIER ACCESS DESIGN UPDATE

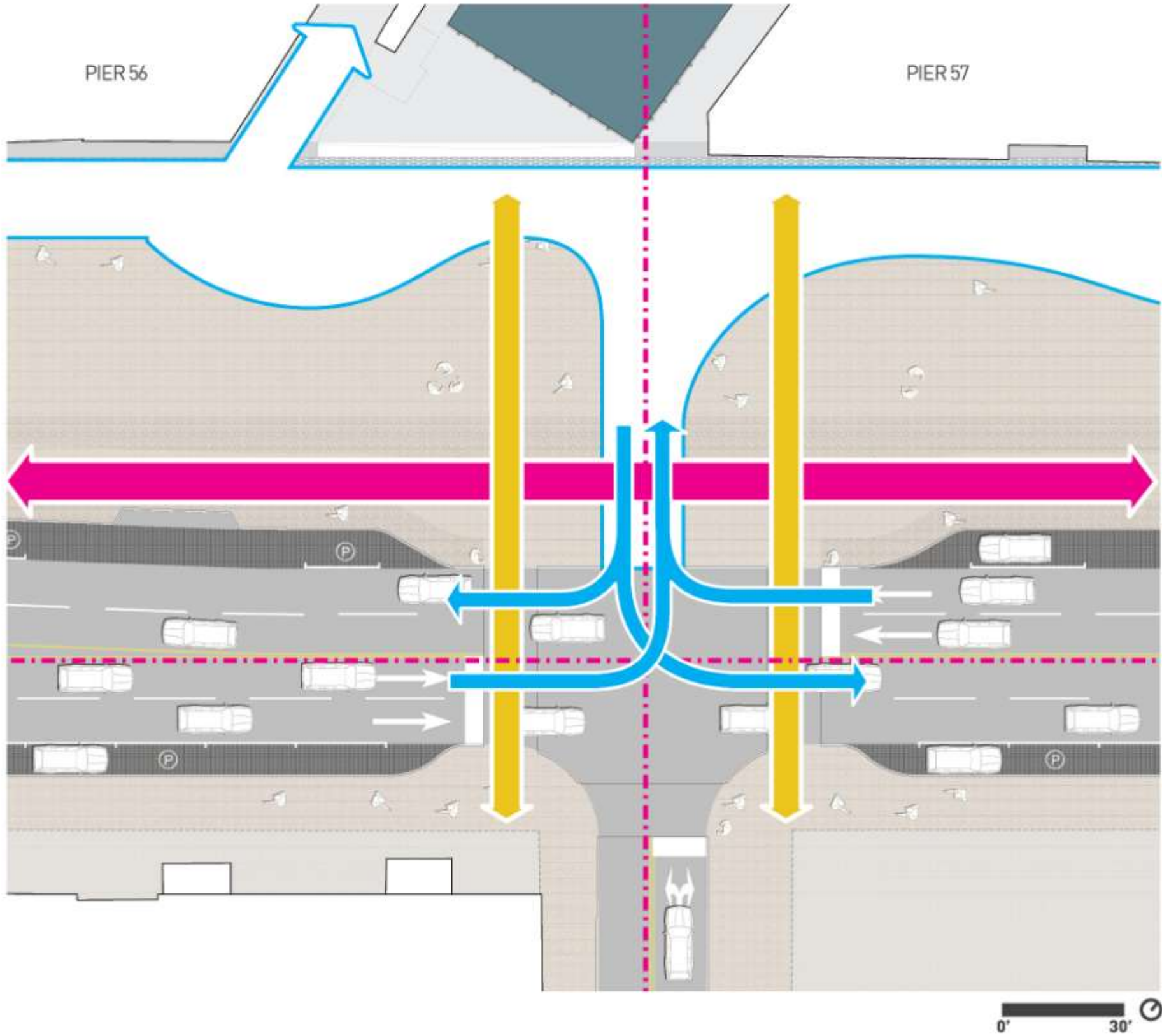
PIER ACCESS

EARLY DESIGN: ACCESS ALIGNED WITH INTERSECTIONS



ACCESS AT INTERSECTION

SAFETY CONSIDERATIONS



MAIN ISSUES

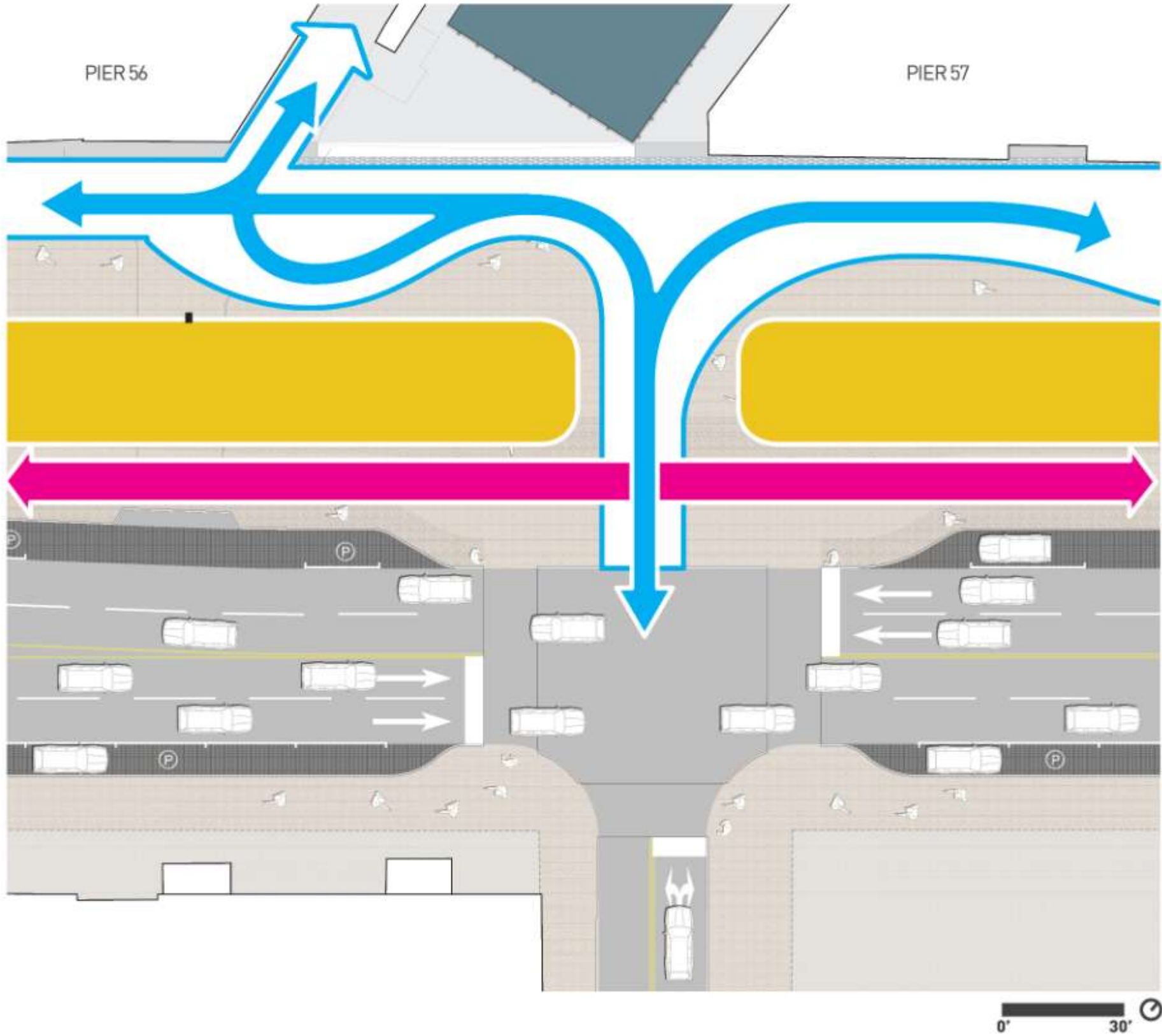
- 1. CREATES A 4-WAY INTERSECTION
- 2. HIGHER VEHICLE SPEED
- 3. RIGHT + LEFT HAND TURN COLLISION THREAT TO CYCLISTS
- 4. LARGE USE OF SPACE

LEGEND

- ↔ PIER ACCESS SPACE REQUIREMENT
- ↔ VEHICLE ENTRANCE + EXIT ROUTES
- ↔ BIKE TRAFFIC
- ↔ PEDESTRIAN CROSSING
- STREET ALIGNMENT

ACCESS AT INTERSECTION

SPACE ALLOCATION



MAIN ISSUES

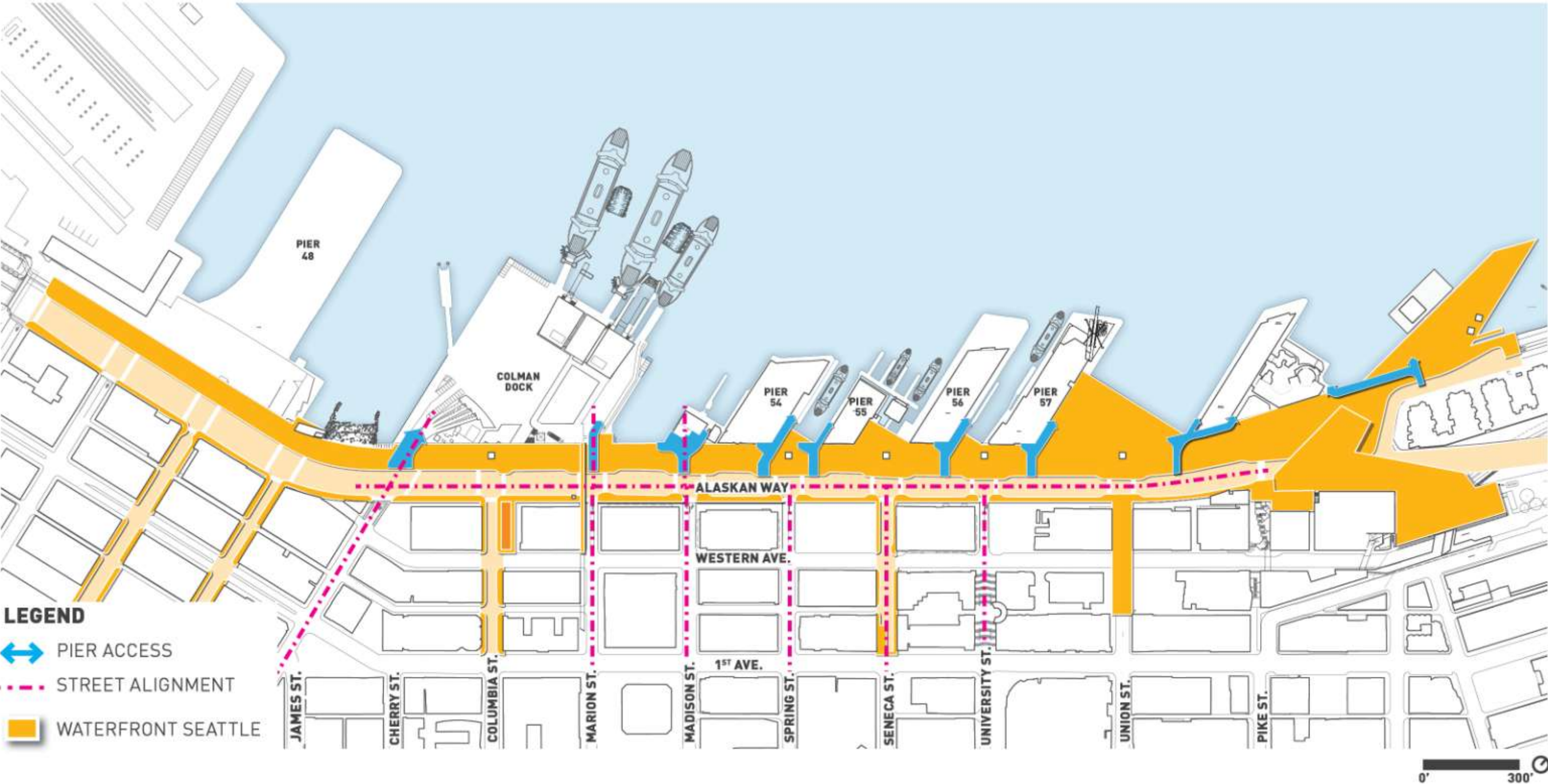
- 1. NOT ALIGNED WITH PIER ENTRANCE
- 2. REQUIRES ADDITIONAL MANEUVERING
- 3. VEHICLES DOMINATE PEDESTRIAN INTERSECTION

LEGEND

- PIER ACCESS REQUIREMENT
- VEHICLE ENTRANCE + EXIT ROUTES
- BIKE TRAFFIC
- USABLE PEDESTRIAN REALM

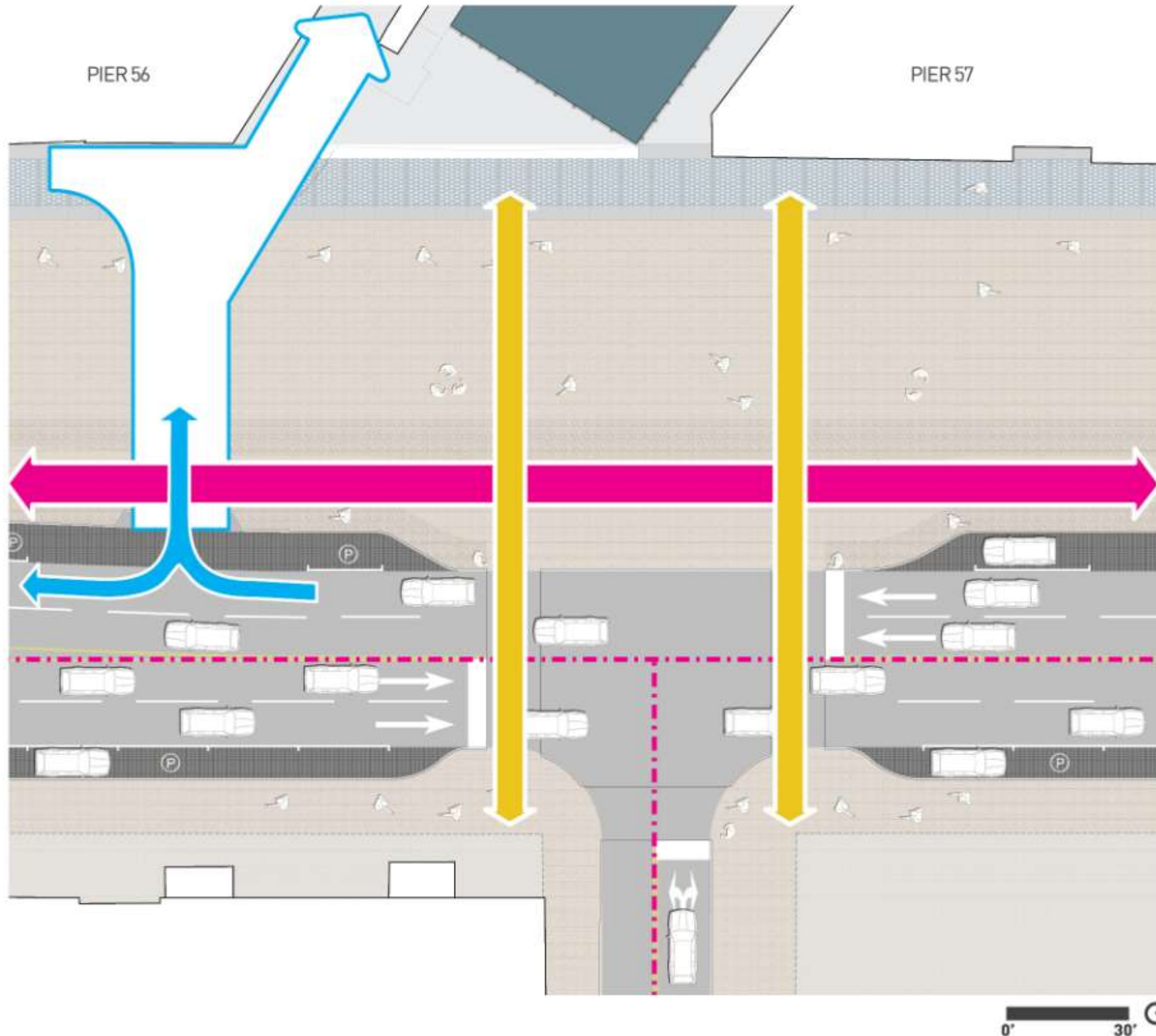
CONCEPT DESIGN, JULY 2012

PIER ACCESS AT MID-BLOCK



MID-BLOCK ACCESS

SAFETY CONSIDERATIONS



MAIN ISSUES

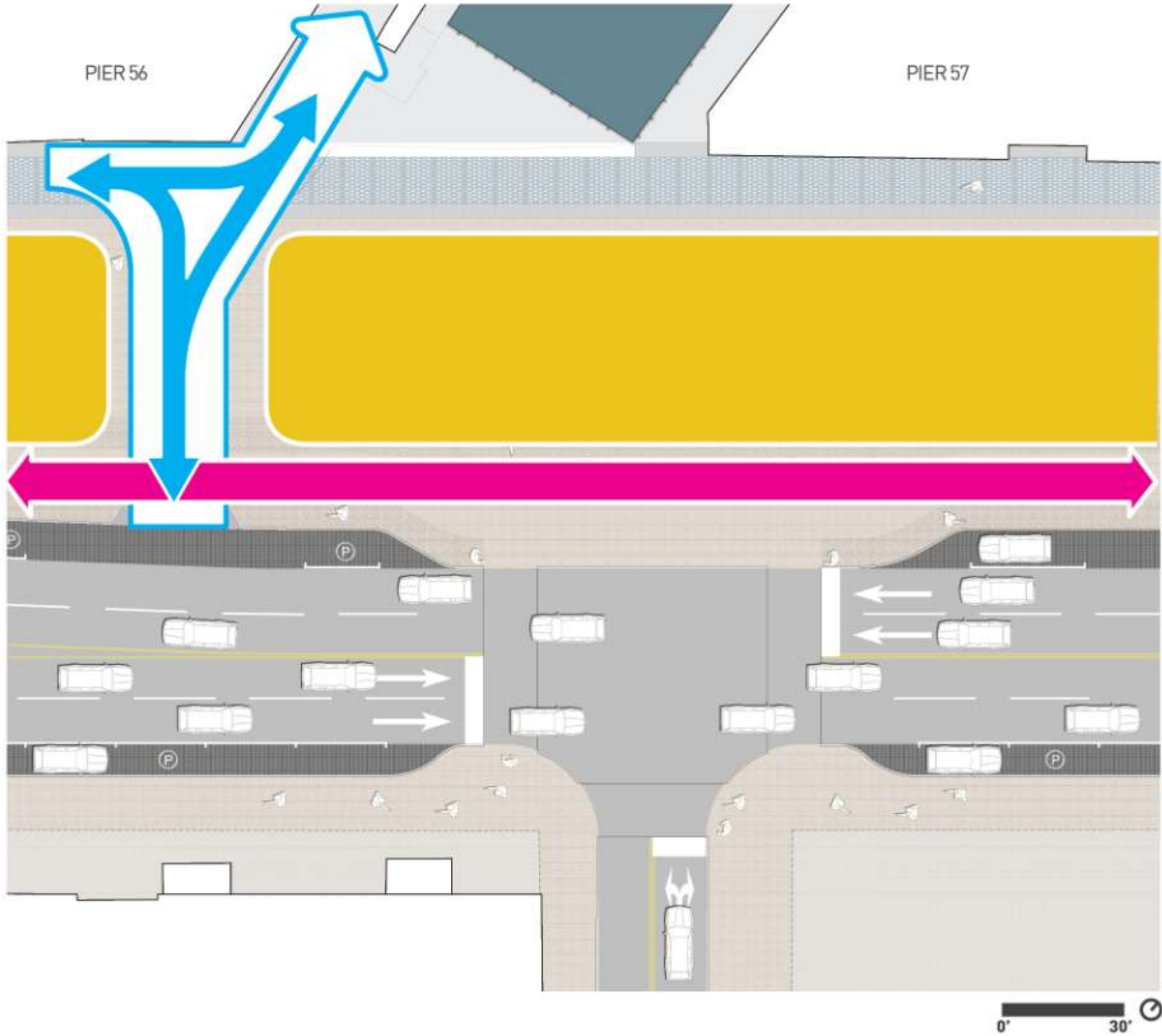
1. ALIGNED WITH EXISTING PIER ACCESS
2. FORCED SLOWER SPEEDS
3. NO SIGNALIZATION NEEDED
4. RIGHT IN, RIGHT OUT
5. DIRECT ROUTE
6. INCREASED LOW-VOLUME BIKE FACILITY CROSSINGS

LEGEND

- ↔ PIER ACCESS REQUIREMENT
- ↔ VEHICLE ENTRANCE + EXIT ROUTES
- ↔ BIKE TRAFFIC
- ↔ PEDESTRIAN CROSSING

MID-BLOCK ACCESS

SPACE ALLOCATION



MAIN ISSUES

- 1. ALIGNED WITH PIER ENTRANCE
- 2. REQUIRES MINIMAL MANEUVERING
- 3. PEDESTRIAN INTERSECTION VEHICLE FREE

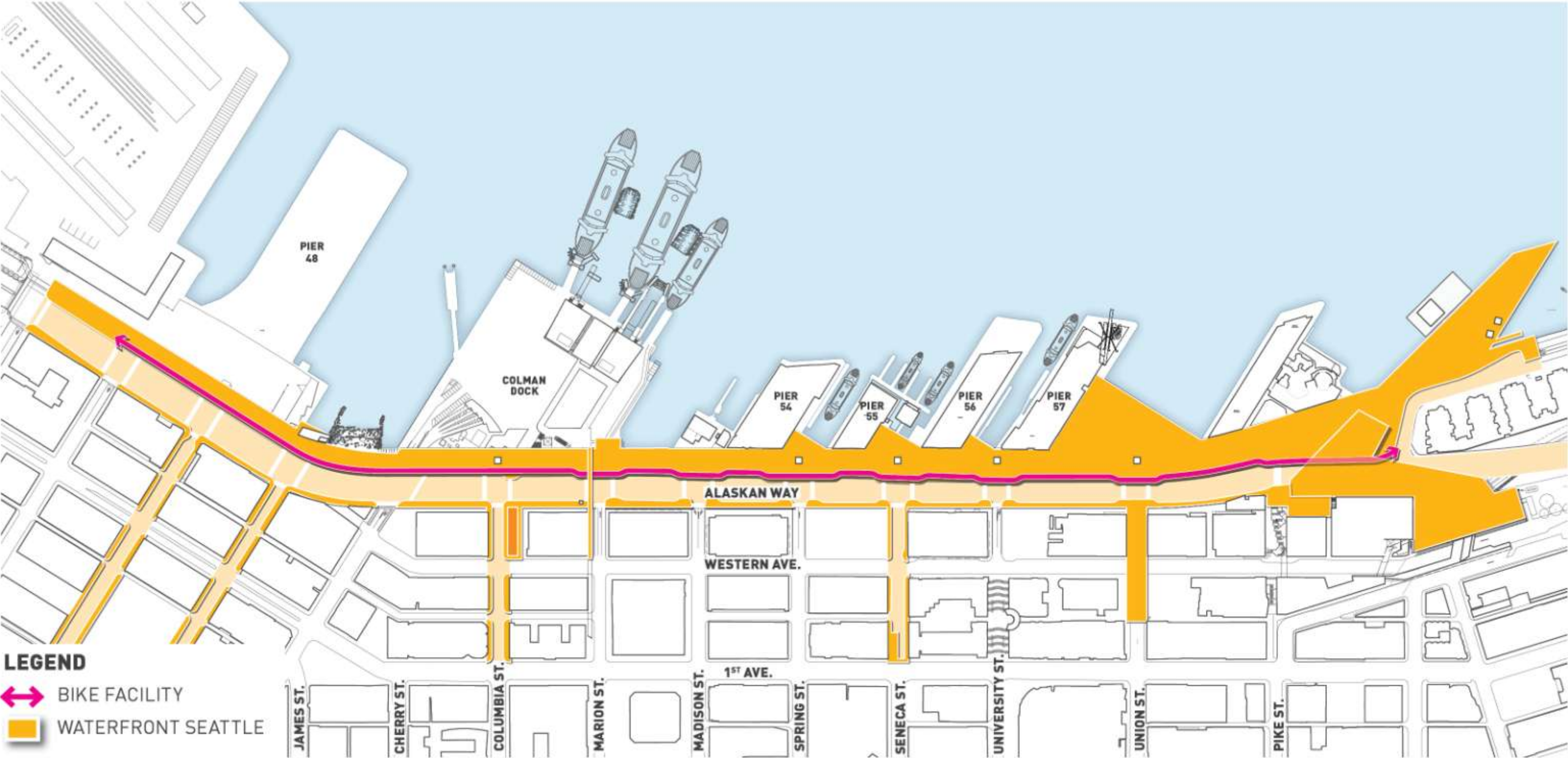
LEGEND

- PIER ACCESS REQUIREMENT
- VEHICLE ENTRANCE + EXIT ROUTES
- BIKE TRAFFIC
- USABLE PEDESTRIAN REALM

BIKE FACILITY DESIGN UPDATE

MARCH, 2013

BIKE FACILITY DESIGN UPDATE



BIKE FACILITY

WIDE VARIETY OF USERS



BIKE COMMUTERS



CASUAL BIKERS



PEDI-CABS

OPTIONS STUDIED

- 1. OFF-STREET PATH (CONCEPT DESIGN)**
- 2. IN-STREET BIKE LANES + REDUCED OFF-STREET PATH**
- 3. TWO-WAY CYCLE TRACK**
- 4. ONE-WAY CYCLE TRACKS (NB + SB)**

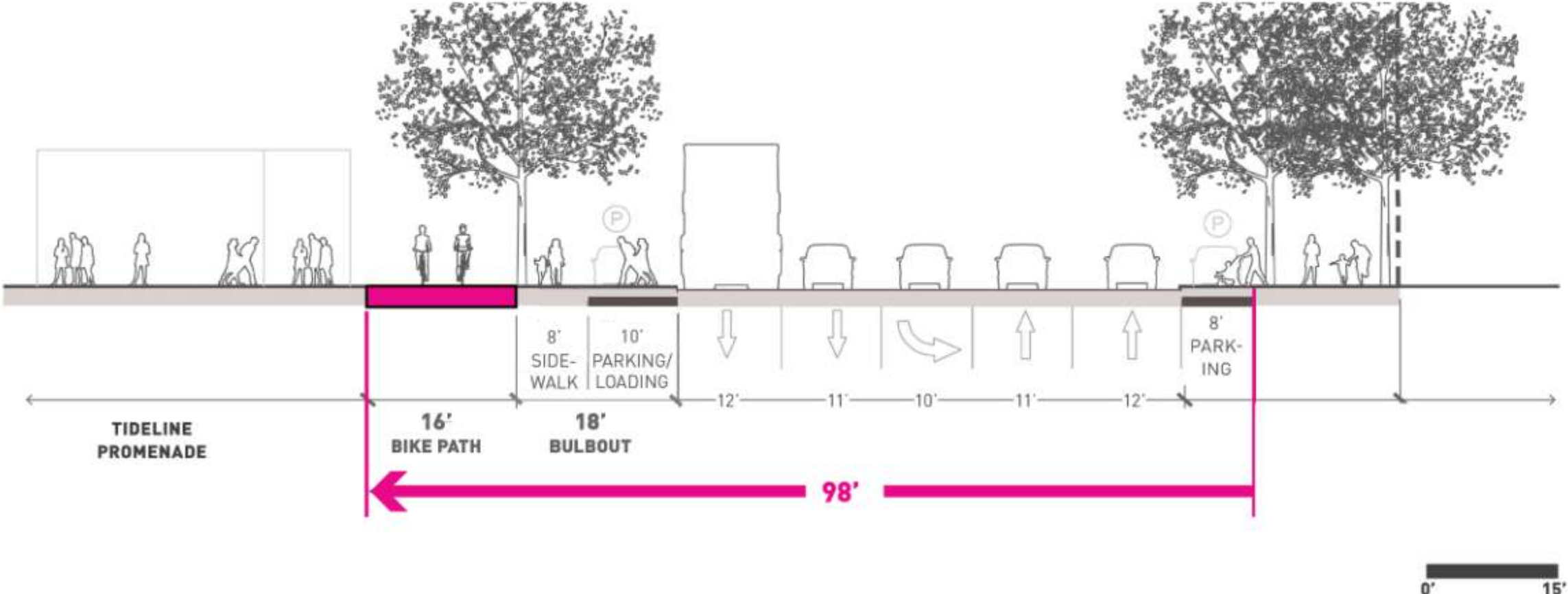
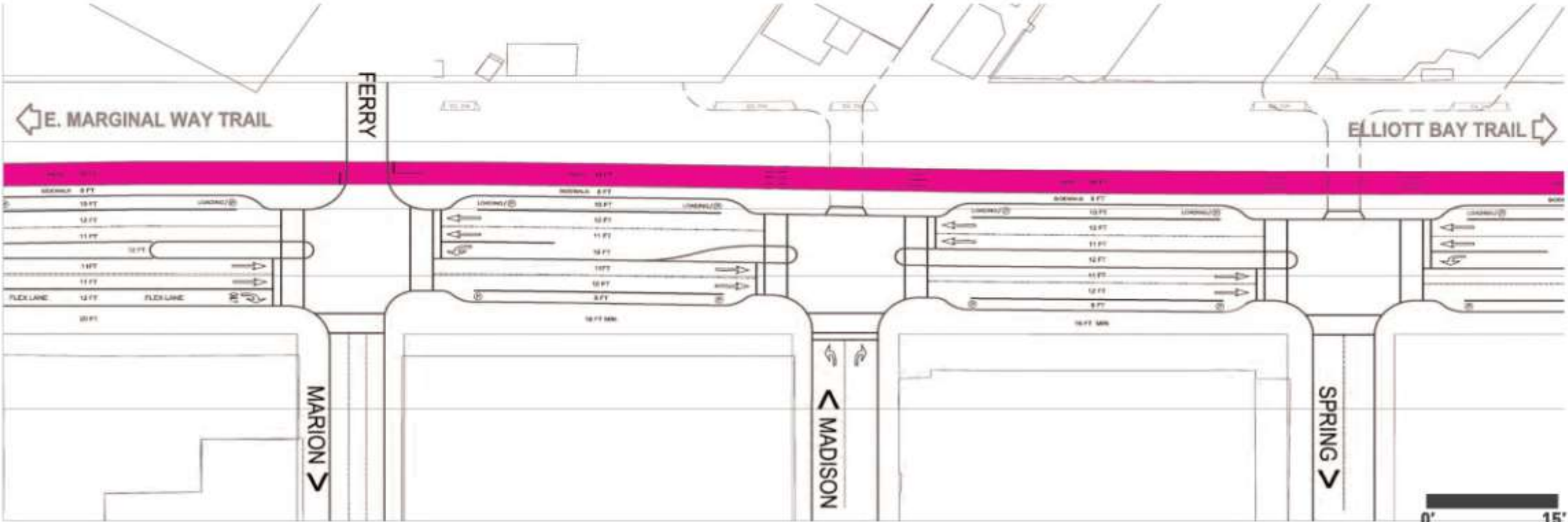
BIKE FACILITY EVALUATION

OFF STREET BIKE PATH



BIKE FACILITY EVALUATION

OFF STREET BIKE PATH



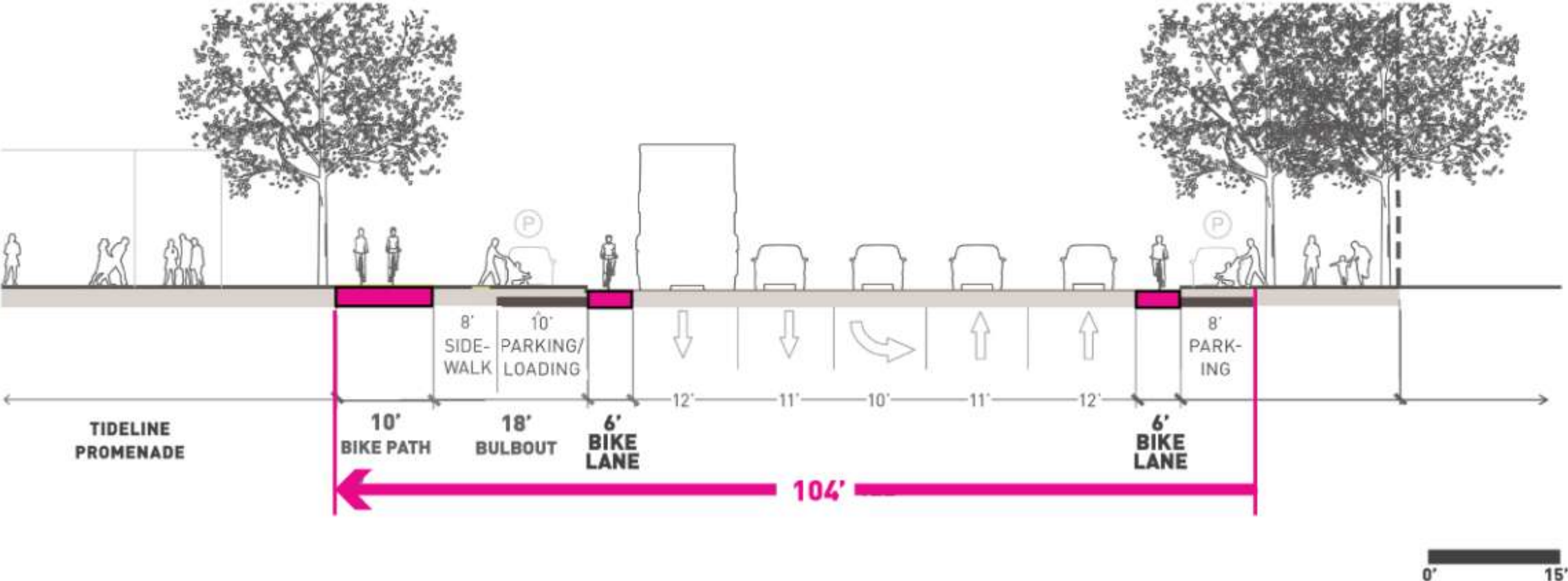
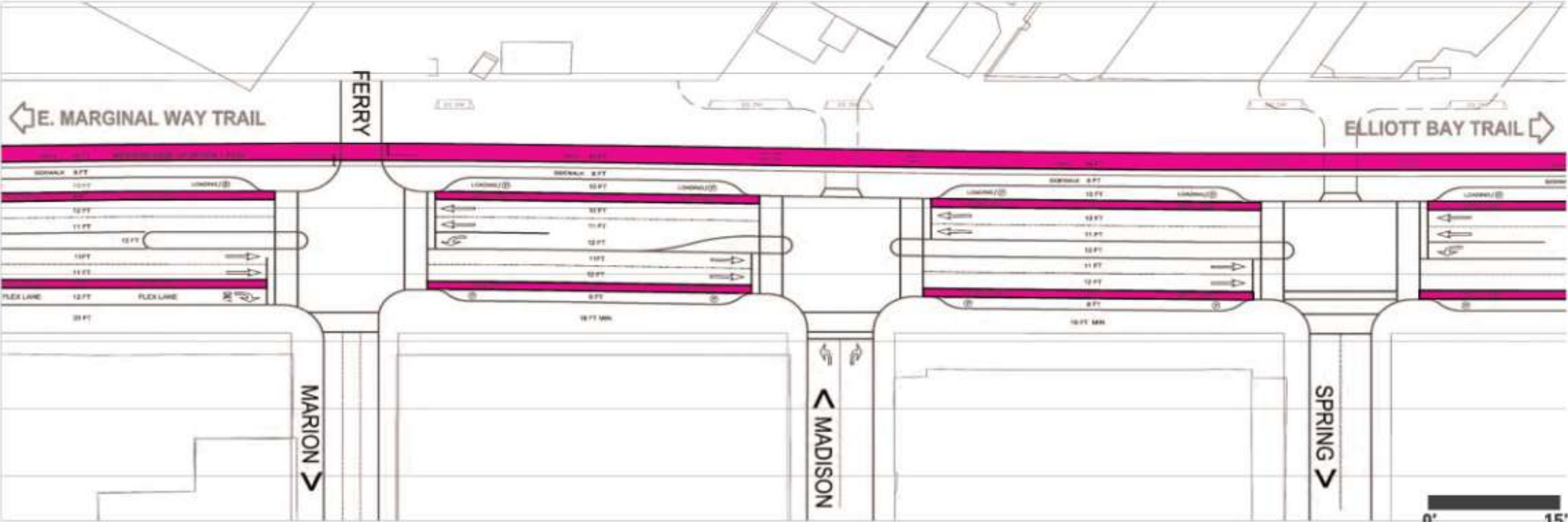
BIKE FACILITY EVALUATION

BIKE LANES + REDUCED OFF-STREET PATH



BIKE FACILITY EVALUATION

BIKE LANES + REDUCED OFF-STREET PATH



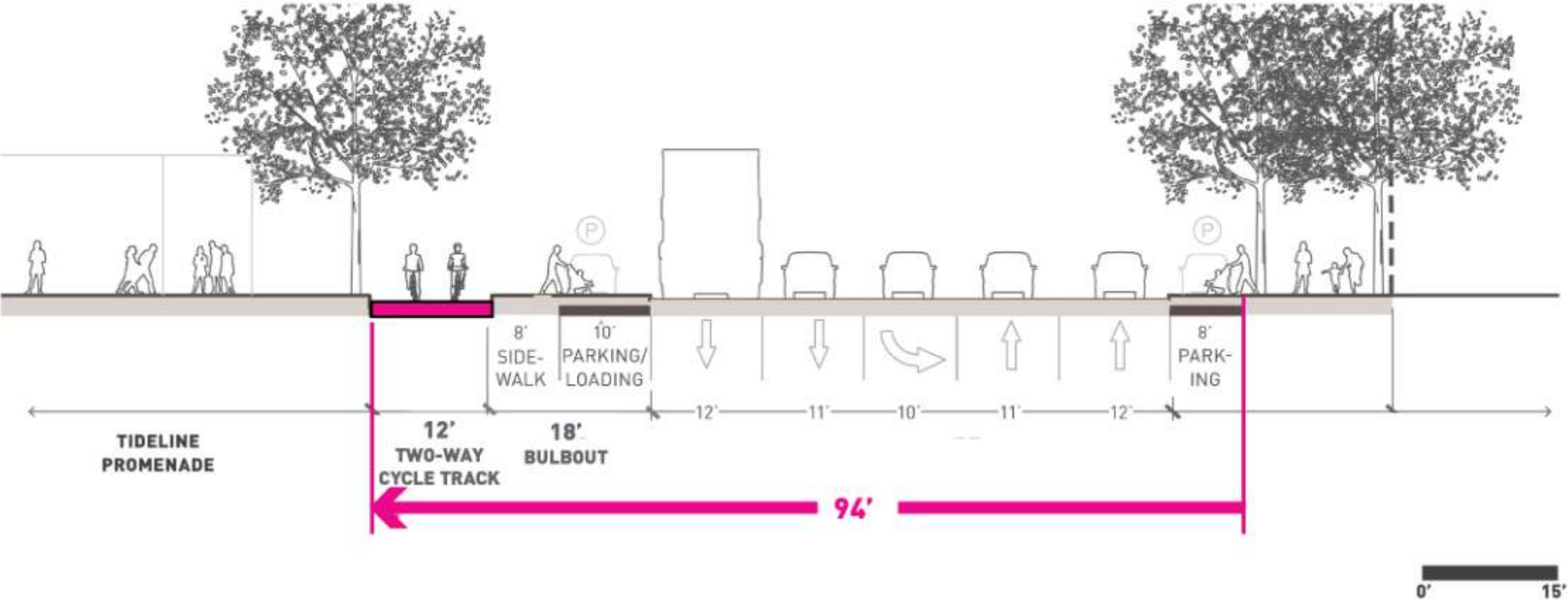
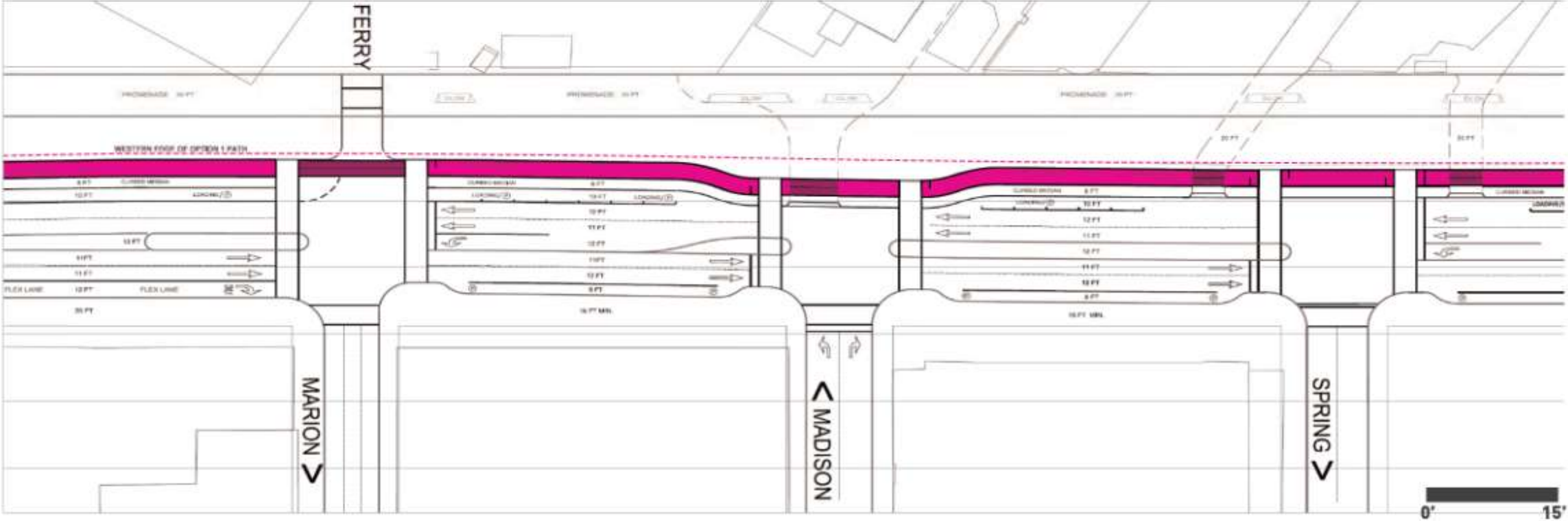
BIKE FACILITY EVALUATION

TWO-WAY CYCLE TRACK



BIKE FACILITY EVALUATION

TWO-WAY CYCLE TRACK



BIKE FACILITY EVALUATION

ONE WAY CYCLE TRACKS (NB + SB)



ONE-WAY CYCLE TRACKS (NB + SB)



BIKE FACILITY

BIKE FACILITY EVALUATION

PERFORMANCE MEASURES	OPTIONS			
	Option 1: Off-street path	Option 2: Bike lanes + reduced off-street path	Option 3: Two-way cycle track	Option 4: One way cycle-track
Tier 1 – Critical Criteria				
Bike/Auto conflicts	<ul style="list-style-type: none">Fewest bike/auto conflict locations	<ul style="list-style-type: none">Conflicts in northbound in-street bike lane	<ul style="list-style-type: none">Fewest bike/auto conflict locations	<ul style="list-style-type: none">Most bike/auto conflict locations (northbound track crosses every east-west street)
Bike/Pedestrian conflicts	<ul style="list-style-type: none">Highest risk of bike/pedestrian conflict at uncontrolled path crossingPedestrians walk on path	<ul style="list-style-type: none">Risk of bike/pedestrian conflict moderately reduced by bike lanes	<ul style="list-style-type: none">Pedestrians protected by signalized crosswalk	<ul style="list-style-type: none">Pedestrians cross two separate cycle tracks.Increase in cyclists riding on promenade northbound
User share	<ul style="list-style-type: none">Not attractive to commuter cyclists	<ul style="list-style-type: none">Attracts the widest range of cyclists	<ul style="list-style-type: none">Serves wide range of cyclists (novice to commuters)	<ul style="list-style-type: none">Serves wide range of cyclists (novice to commuters)
Tier 2 – General Criteria				
Consistency with Draft Bike Master Plan Update	<ul style="list-style-type: none">Consistent with Bike Master Plan Update	<ul style="list-style-type: none">Street has too much traffic for bike lanes.	<ul style="list-style-type: none">Consistent with Bike Master Plan Update	<ul style="list-style-type: none">Consistent with Bike Master Plan Update
Promenade influence	<ul style="list-style-type: none">No significant impact on promenade width or design	<ul style="list-style-type: none">No significant impact on promenade width or design	<ul style="list-style-type: none">No significant impact on promenade width but increased number of casual riders likely to use promenade	<ul style="list-style-type: none">No significant impact on promenade width but increased number of casual riders likely to use promenade
Parking/loading	<ul style="list-style-type: none">Each Option provides similar parking/loading zone capacity	<ul style="list-style-type: none">Each Option provides similar parking/loading zone capacity	<ul style="list-style-type: none">Each Option provides similar parking/loading zone capacity	<ul style="list-style-type: none">Each Option provides similar parking/loading zone capacity
Pedestrian load/unload	<ul style="list-style-type: none">8-foot sidewalk allows adequate space for load/unload of people, strollers and wheelchairs; including transit and charter buses	<ul style="list-style-type: none">8-foot sidewalk allows adequate space for load/unload of people, strollers and wheelchairs; including transit and charter buses	<ul style="list-style-type: none">Provides same 8-foot sidewalk as Options 1 and 2, but pedestrians must cross cycle track at crosswalks.	<ul style="list-style-type: none">Sidewalk could be widened to perform as Option 3.
Bicycle network connectivity + Legibility	<ul style="list-style-type: none">Contiguous connection to Elliott Bay trail.Primary waterfront bicycle route is very clear to users	<ul style="list-style-type: none">Bike path provides contiguous connection to Elliott Bay trail, but north-bound bike lane does notTransition to bike lanes is counter-intuitive.	<ul style="list-style-type: none">Contiguous connection to Elliott Bay trailPrimary waterfront bicycle route is very clear to users	<ul style="list-style-type: none">No contiguous north-bound connection to Elliott Bay trailCyclists may ride the wrong way on the one-way track.
Street scale	<ul style="list-style-type: none">Narrowest crossing	<ul style="list-style-type: none">Street width larger due to added bike lanes.	<ul style="list-style-type: none">Street width larger due to added cycle track and buffer.	<ul style="list-style-type: none">Street width larger due to added cycle track and buffer (in both directions).

LEGEND

UNFAVORABLE

MODERATE

FAVORABLE

PRELIMINARY PREFERRED OPTION IDENTIFIED - FEBRUARY 2013

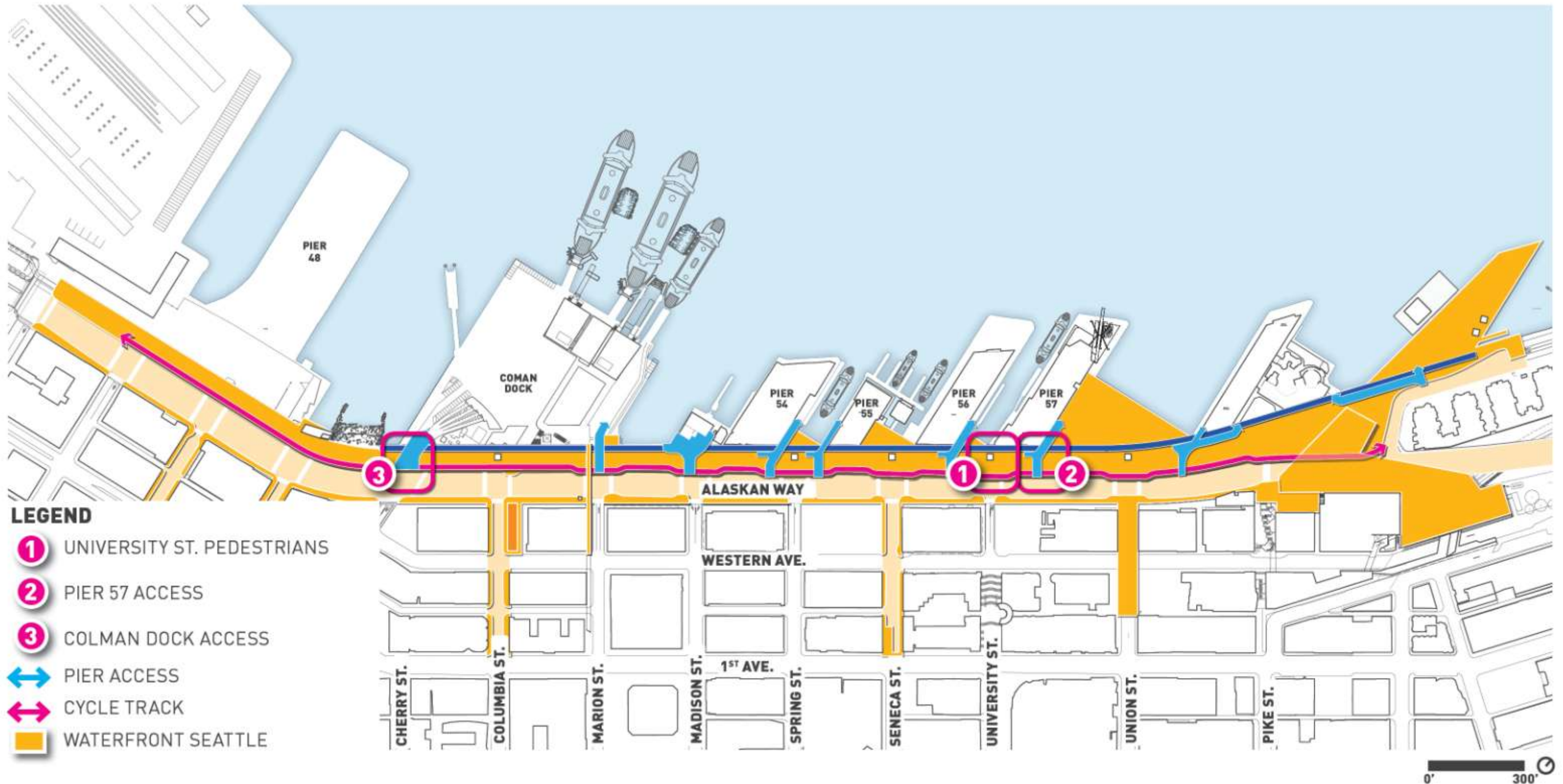
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LEGEND

	UNFAVORABLE
	MODERATE
	FAVORABLE

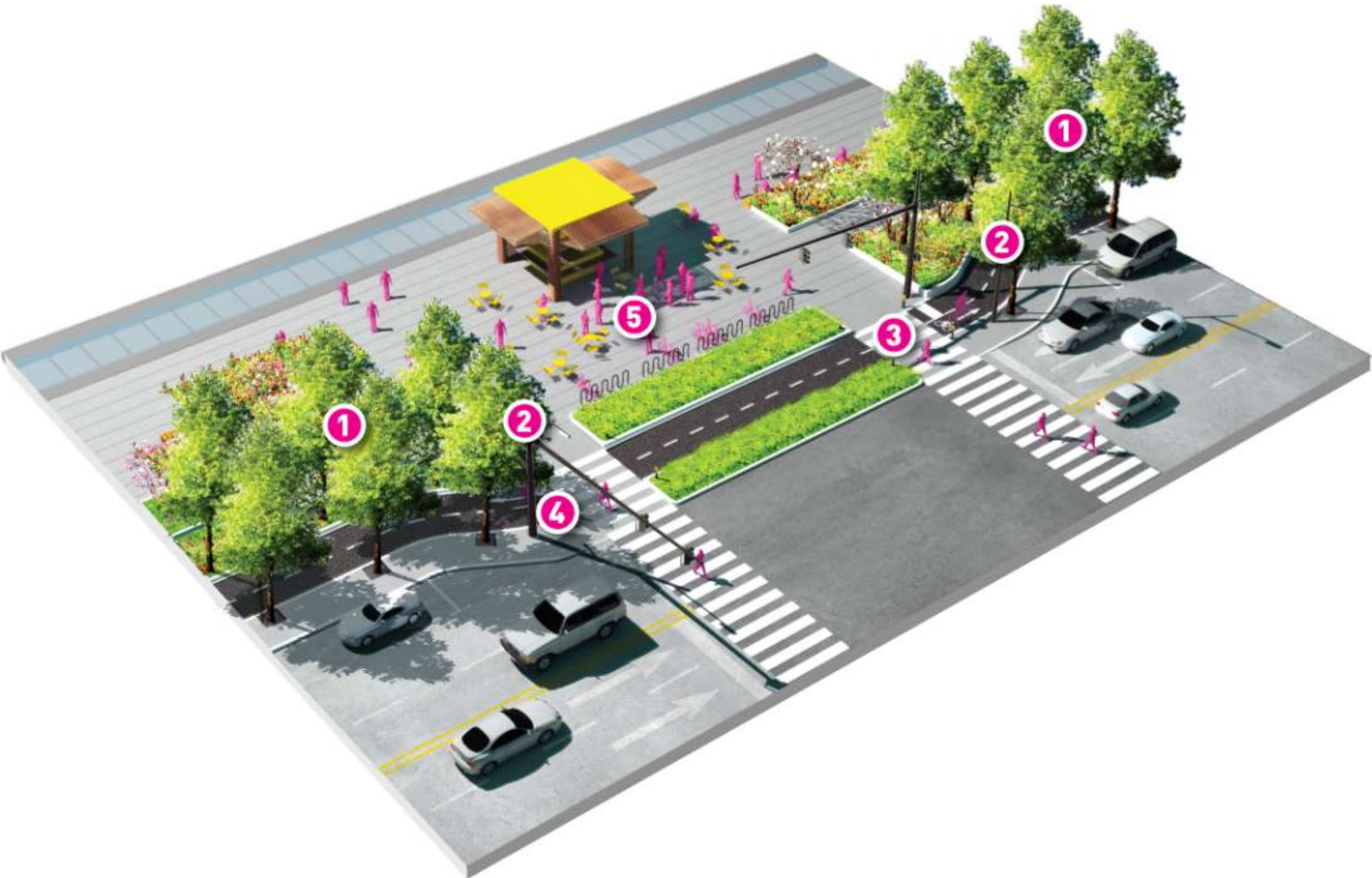
MARCH 2013

SAMPLE CYCLE TRACK INTERSECTIONS



TPOLOGY OF INTERSECTIONS

UNIVERSITY ST. - HEAVY PEDESTRIAN ACTIVITY

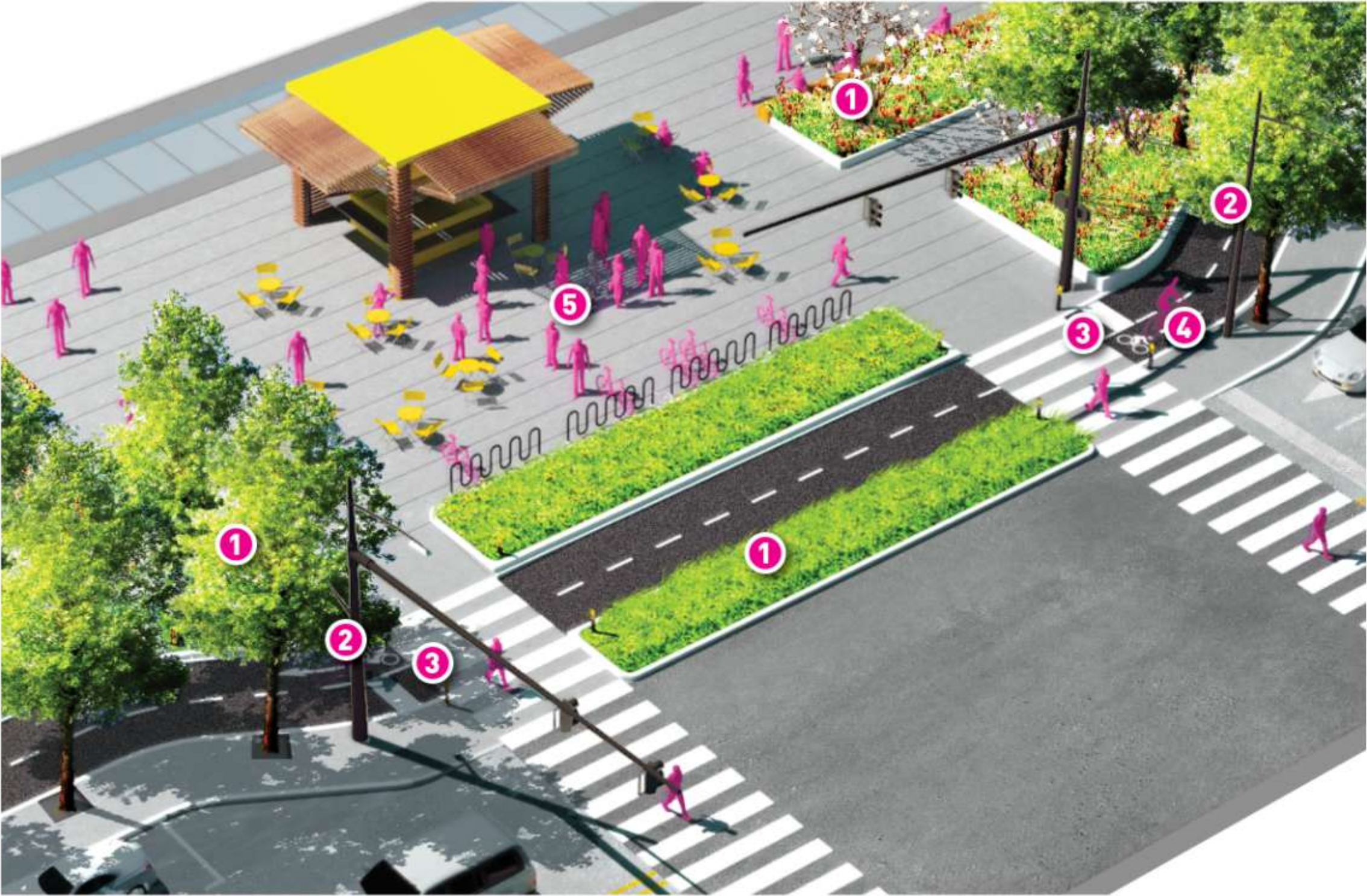


LEGEND

- 1 PLANTING
- 2 LIGHTING
- 3 LEVELING
- 4 WAYFINDING
- 5 PROGRAM OPPORTUNITY

TPOLOGY OF INTERSECTIONS

UNIVERSITY ST. - HEAVY PEDESTRIAN ACTIVITY

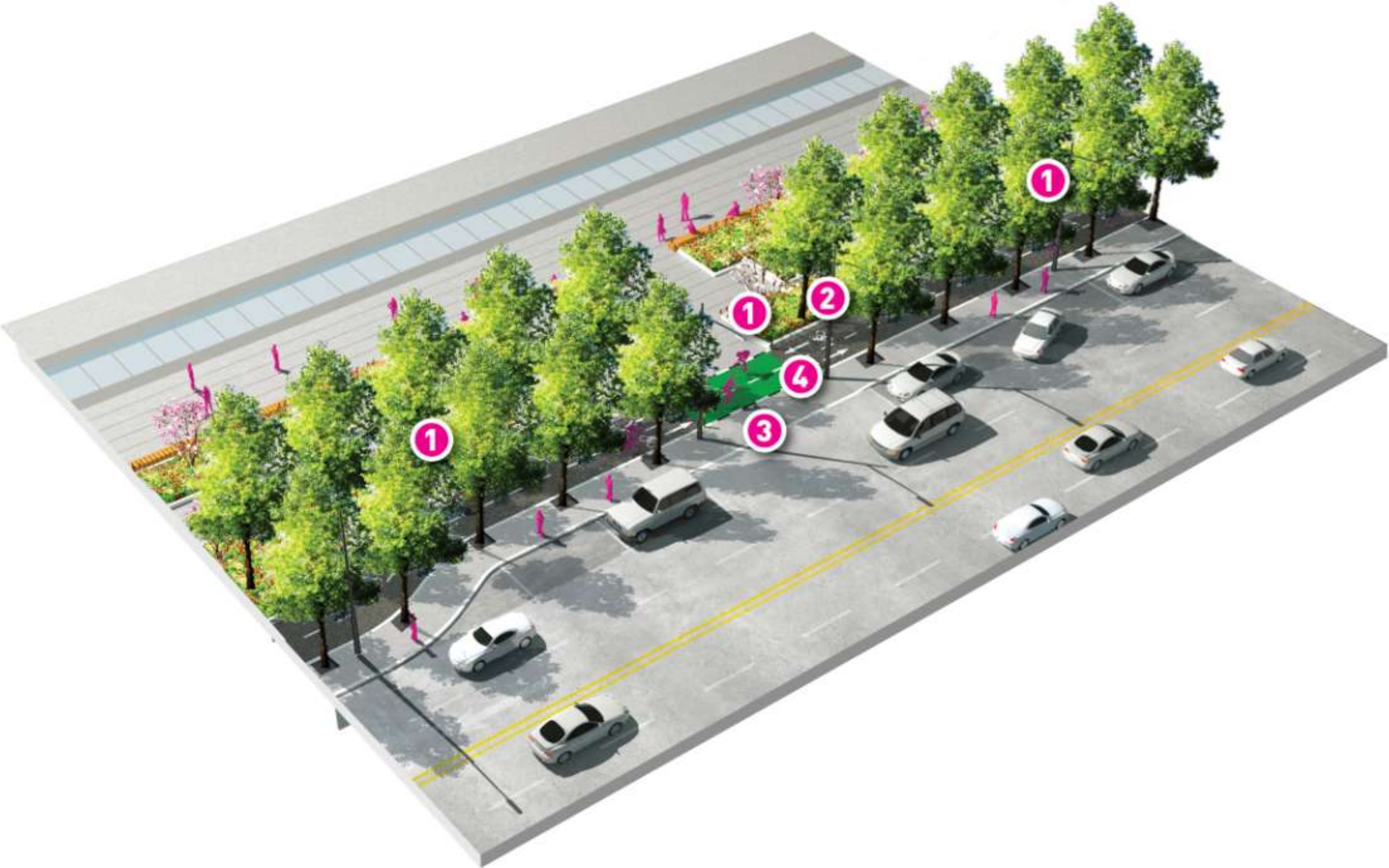


LEGEND

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- 3 LEVELING
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- 5 PROGRAM OPPORTUNITY

TPOLOGY OF INTERSECTIONS

PIER 57 ACCESS - MODERATE VEHICULAR ACTIVITY

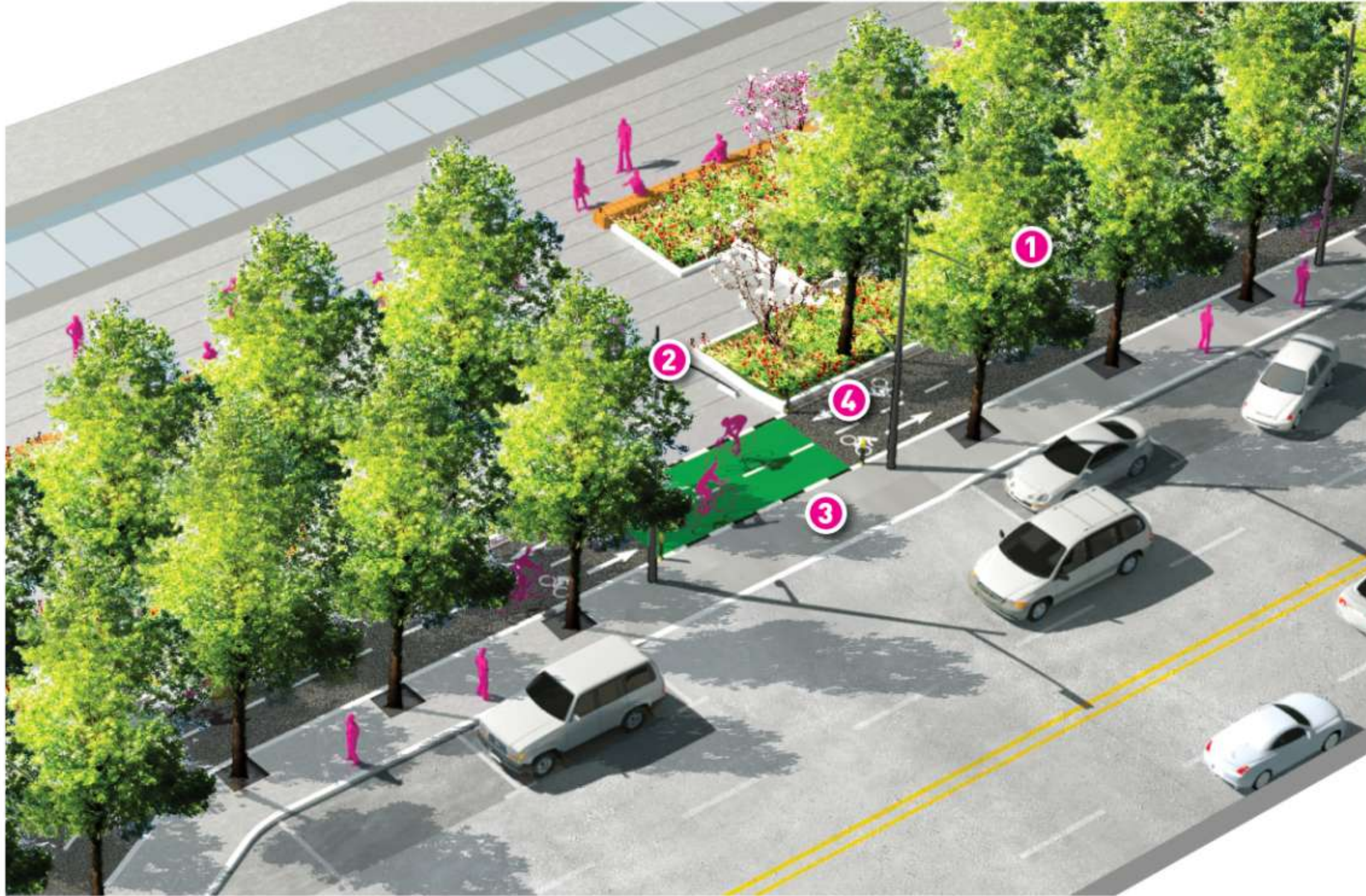


LEGEND

- 1 PLANTING
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- 4 WAYFINDING

TYOLOGY OF INTERSECTIONS

PIER 57 ACCESS - MODERATE VEHICULAR ACTIVITY

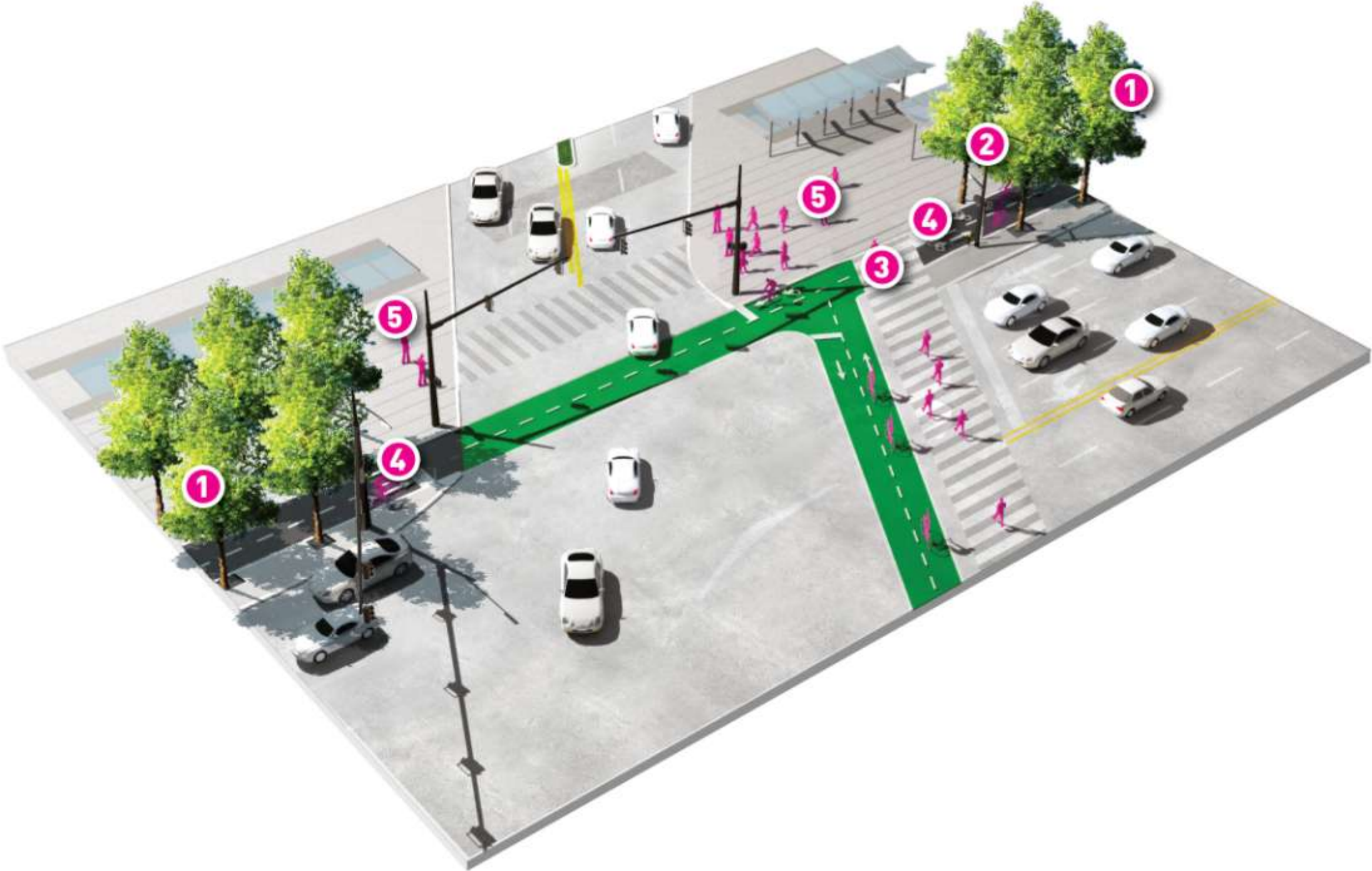


LEGEND

- 1** PLANTING
- 2** LIGHTING
- 3** LEVELING
- 4** WAYFINDING

TYPOLGY OF INTERSECTIONS

PIER ACCESS AT COLMAN DOCK - HEAVY VEHICULAR ACTIVITY

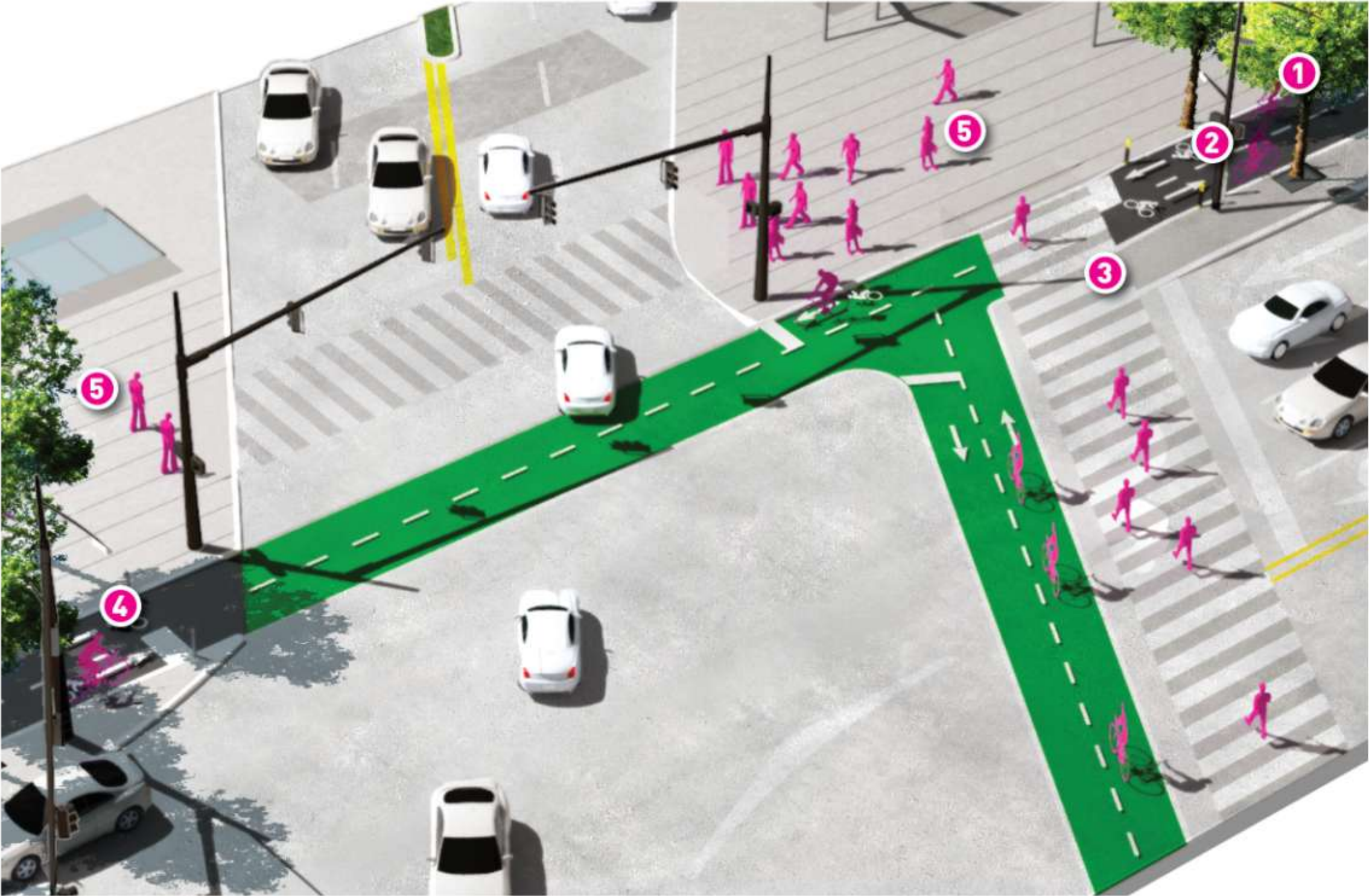


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TPOLOGY OF INTERSECTIONS

PIER ACCESS AT COLMAN DOCK - HEAVY VEHICULAR ACTIVITY



LEGEND

- 1 PLANTING
- 2 LIGHTING
- 3 LEVELING
- 4 WAYFINDING
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TWO-WAY CYCLE TRACK

A STATE OF THE ART BIKE FACILITY

- **SAFE, RELIABLE + CONNECTED**
- **LIMITED VEHICLE CONFLICTS**
- **ENCOURAGES USE BY A WIDE RANGE OF CYCLISTS**
- **APPLICATION OF BEST PRACTICES**

THE CYCLIST'S PUBLIC REALM EXPERIENCE + ASSET TO THE WATERFRONT PUBLIC REALM
PROGRAM WITH OPPORTUNITY



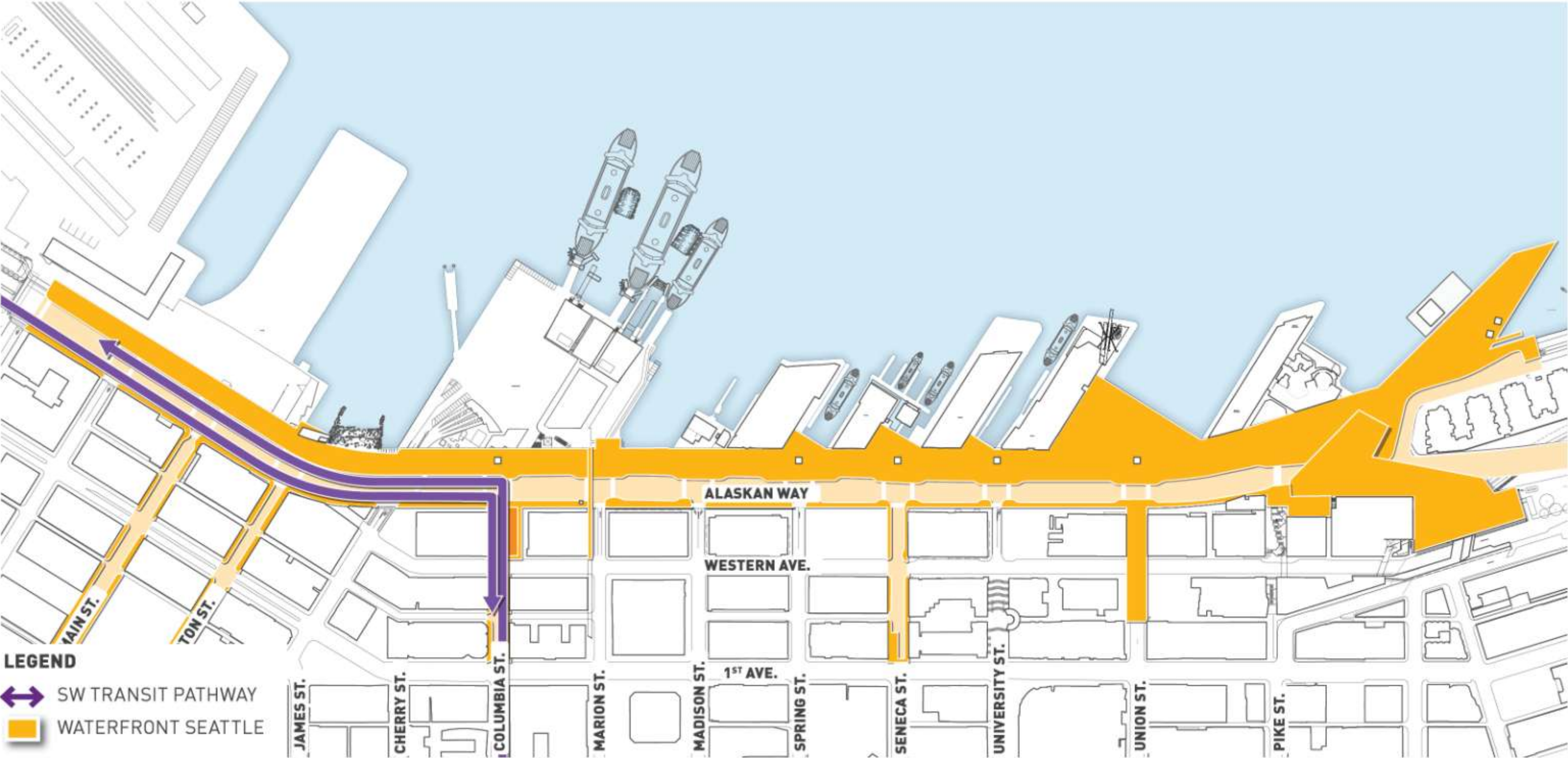
THE CYCLIST'S PUBLIC REALM EXPERIENCE + ASSET TO THE WATERFRONT PUBLIC REALM
PROGRAM WITH OPPORTUNITY



SOUTHWEST TRANSIT PATHWAY DESIGN UPDATE

MARCH, 2013

SOUTHWEST TRANSIT PATHWAY DESIGN UPDATE





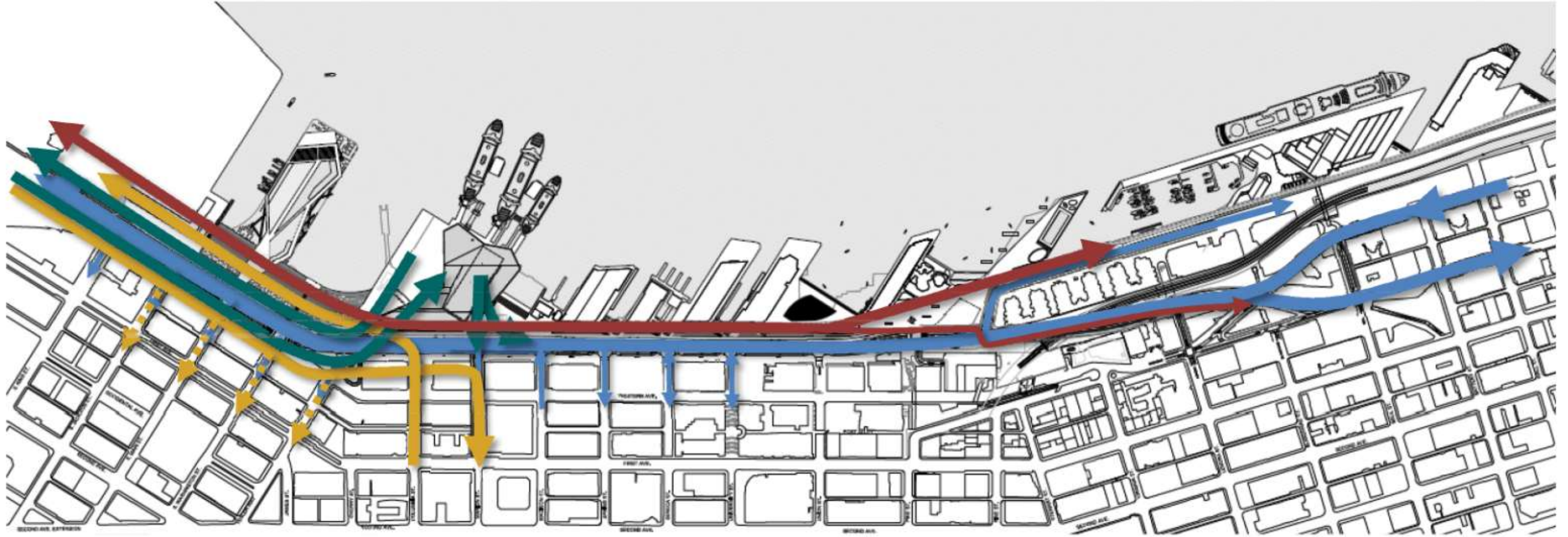
TODAY

SOUTHWEST TRANSIT PATHWAY ON THE VIADUCT

- **TODAY, BUSES FROM SOUTHWEST COMMUNITIES ACCESS DOWNTOWN USING THE VIADUCT (AWV).**
- **AFTER VIADUCT DEMO, BUSES WILL ACCESS DOWNTOWN USING ALASKAN WAY**
- **DURING THE PM PEAK PERIOD, UP TO 50 BUSES PER HOUR WILL USE ALASKAN WAY IN THE PEAK DIRECTION, AND 30 IN THE OFF PEAK DIRECTION, THE CORRIDOR SERVES OVER 22,000 RIDERS A DAY, INCLUDING RAPIDRIDE C AND D LINES**

JULY, 2012

FUNCTIONS OF THE STREET



- VEHICLES, PARKING AND LOADING
- FERRIES: LOADING AND UNLOADING
- TRANSIT LINKAGE
- NORTH/SOUTH BICYCLE AND PEDESTRIAN MOVEMENT

SOUTHWEST TRANSIT PATHWAY
PIONEER SQUARE

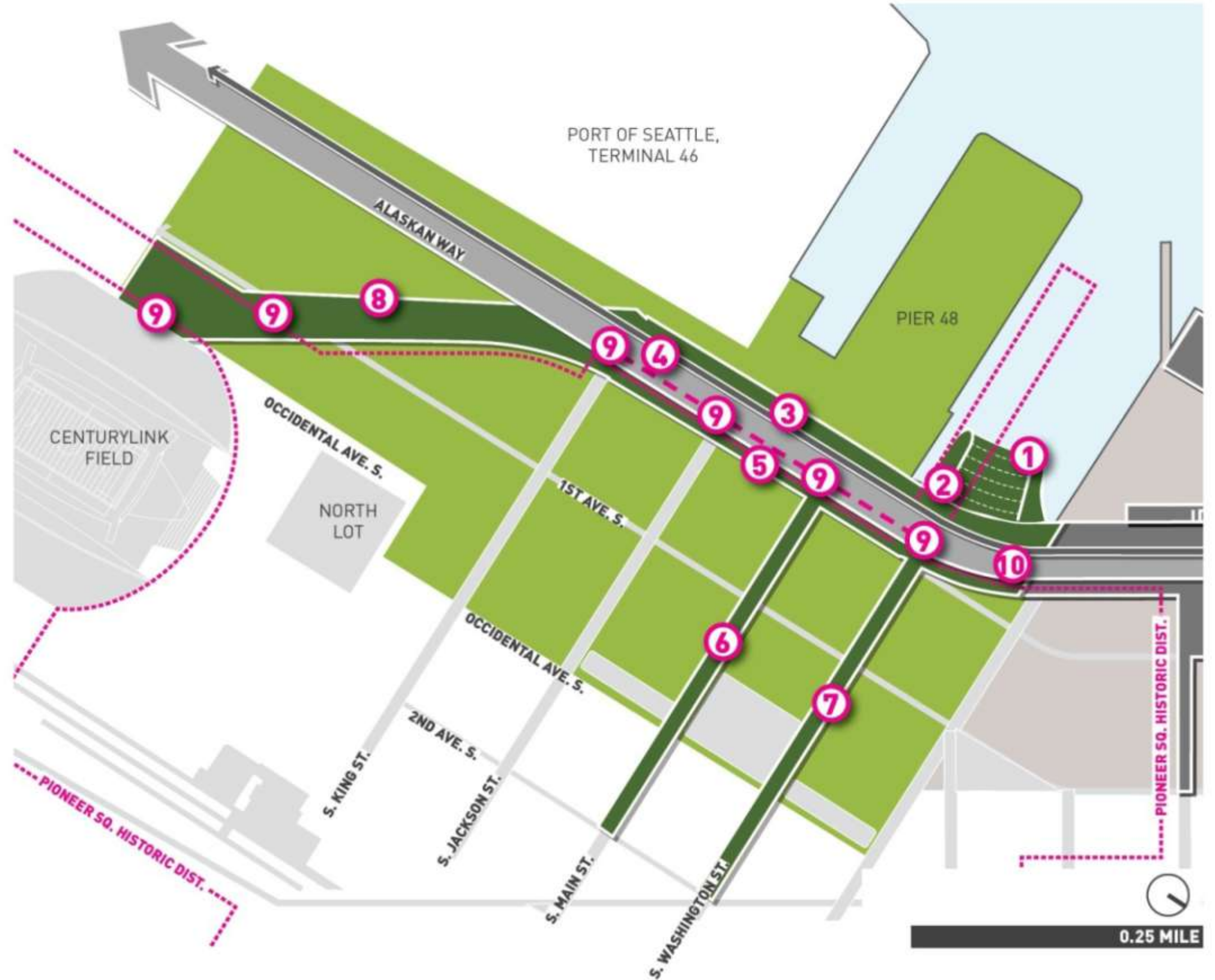
- 1 SEAWALL BEACH
- 2 WASHINGTON ST. BOAT LANDING
- 3 BOARDWALK
- 4 GLACIAL ERRATICS
- 5 FIR SHORELINE
- 6 SEAWALL BENCH
- 7 CONNECTION TO PIER 48
- 8 S. MAIN ST. IMPROVEMENTS
- 9 S. WASHINGTON ST. IMPROVEMENTS
- CORE PROJECT AREA
- SEAWALL



APPROACH TO PROGRAM

PIONEER SQUARE NEIGHBORHOOD PROJECT ELEMENTS

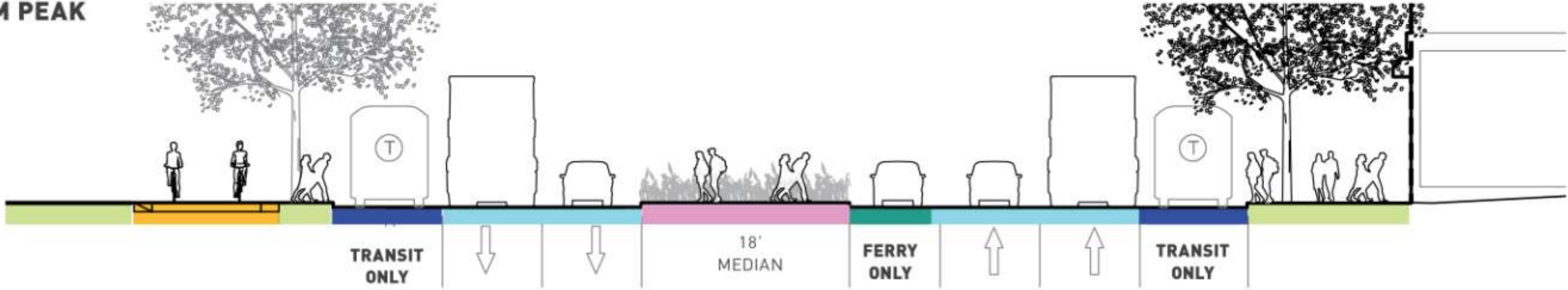
- ① PIONEER SQUARE BEACH
- ② WASHINGTON ST. BOAT LANDING
- ③ TIDELINE PROMENADE
- ④ CYCLE TRACK
- ⑤ EAST SIDE PUBLIC REALM
- ⑥ MAIN STREET
- ⑦ WASHINGTON STREET
- ⑧ RAILROAD WAY
- ⑨ INTERSECTIONS
- ⑩ ALASKAN WAY



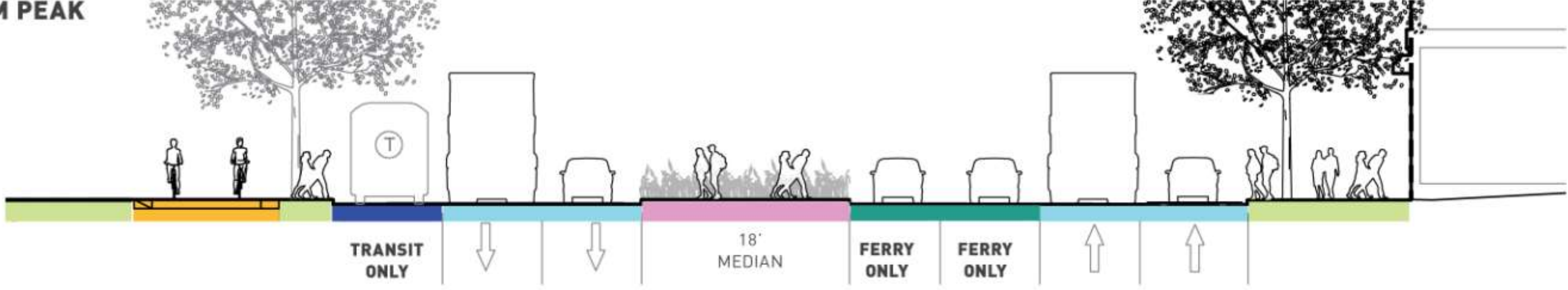
JULY, 2012

FLEX LANES

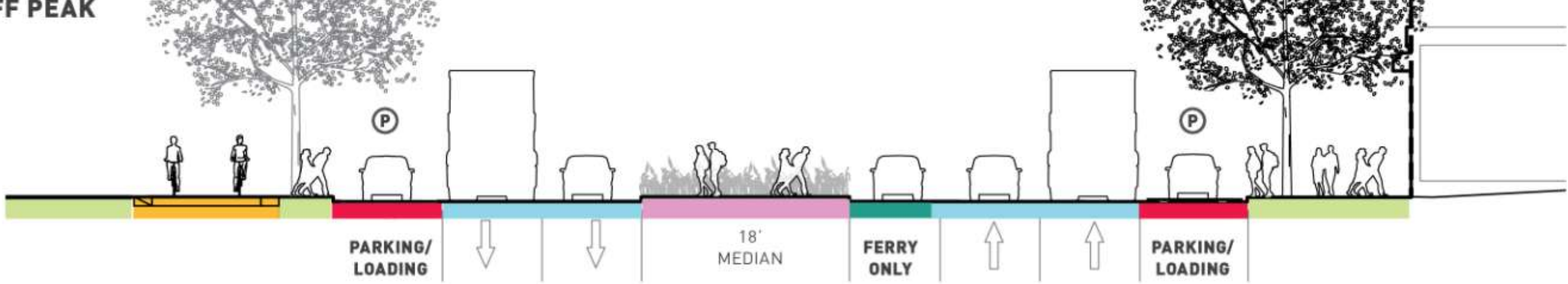
AM PEAK



PM PEAK

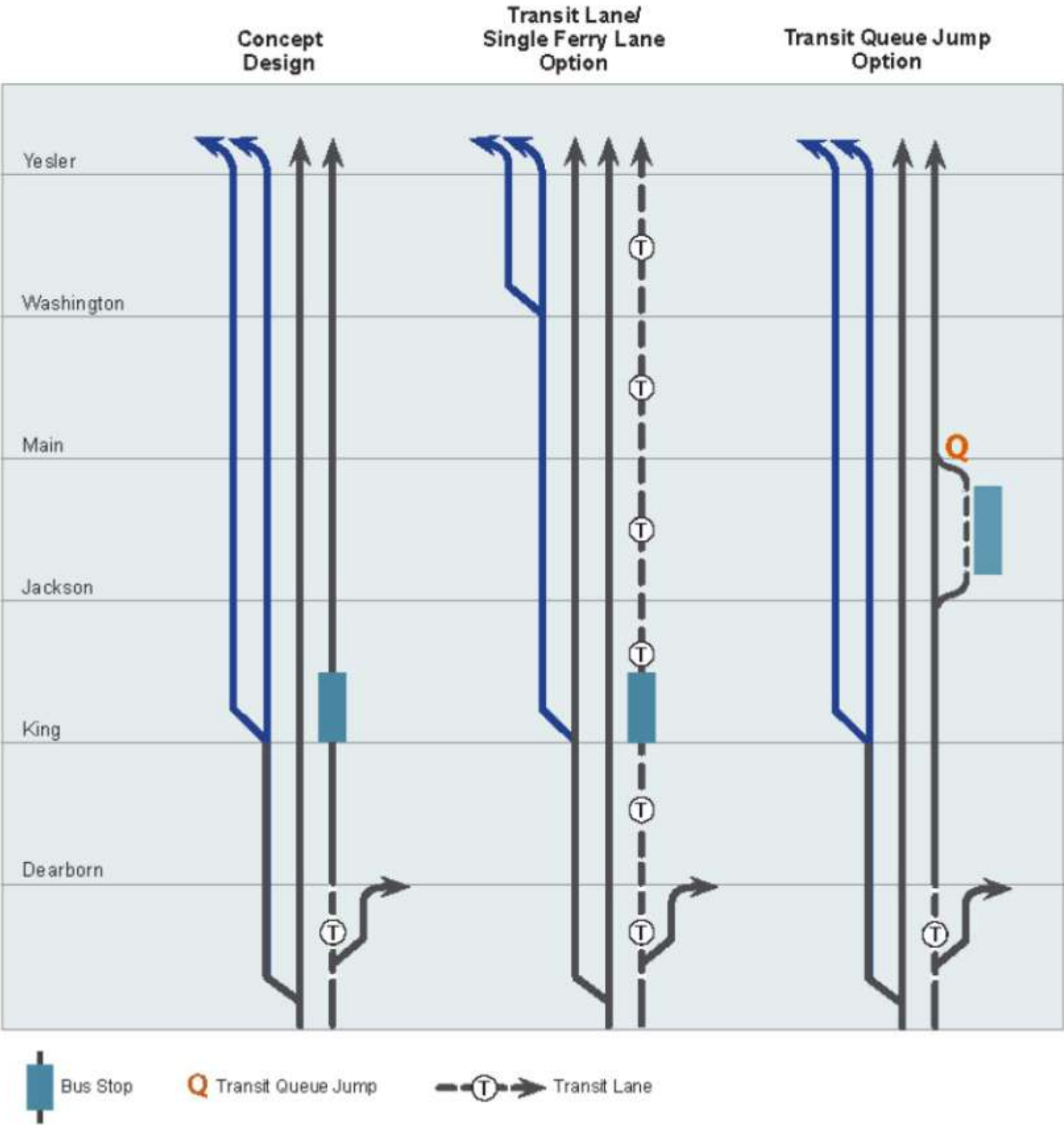


OFF PEAK



SOUTHWEST TRANSIT PATHWAY

PM PEAK HOUR LANE CONFIGURATIONS



SOUTHWEST TRANSIT PATHWAY OPTIONS

CURRENT PROPOSED DESIGN

PM PEAK CONDITION



SOUTHWEST TRANSIT PATHWAY

NORTHBOUND TRANSIT LANE/SINGLE FERRY LANE OPTION



NORTHBOUND TRANSIT QUEUE JUMP OPTION



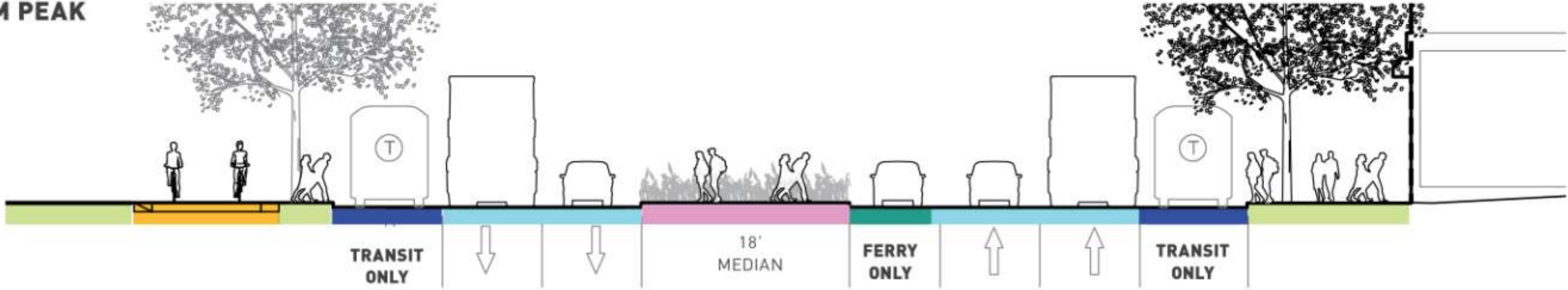
Southwest Transit Pathway Options for Alaskan Way – Northbound PM Peak

	Concept Design	Transit lane option	Transit queue jump option
Northbound lane configuration in PM peak (west to east)	Ferry/Ferry/General/General	Ferry/General /General/Transit (plus additional ferry turn lane between Washington and Yesler)	Ferry/Ferry/General/General (plus additional transit lane pull out between Jackson and Main)
Transit priority measures	Transit lane on Dearborn NB off ramp	Transit lane on Dearborn NB off ramp Transit lane on Alaskan Way Dearborn to Columbia	Transit lane on Dearborn NB off ramp Transit queue jump at Main
Transit travel time – Dearborn to Columbia (minutes)	2.7	2.2	2.4
General Purpose traffic travel time – Dearborn to Columbia (minutes)	1.9	1.8	1.8
Street width at Main*	7 lanes/96 ft	7 lanes/96 ft	8 lanes/106 ft
Street width at Yesler*	7 lanes/78 ft	8 lanes/88 ft	7 lanes /78 ft
Northbound bus stop location/type during PM peak	King-Jackson/in lane	King-Jackson/in lane	Jackson-Main/pull-out with queue jump at Main signal
Northbound right turn prohibitions	None	None	NB right turn to Main prohibited

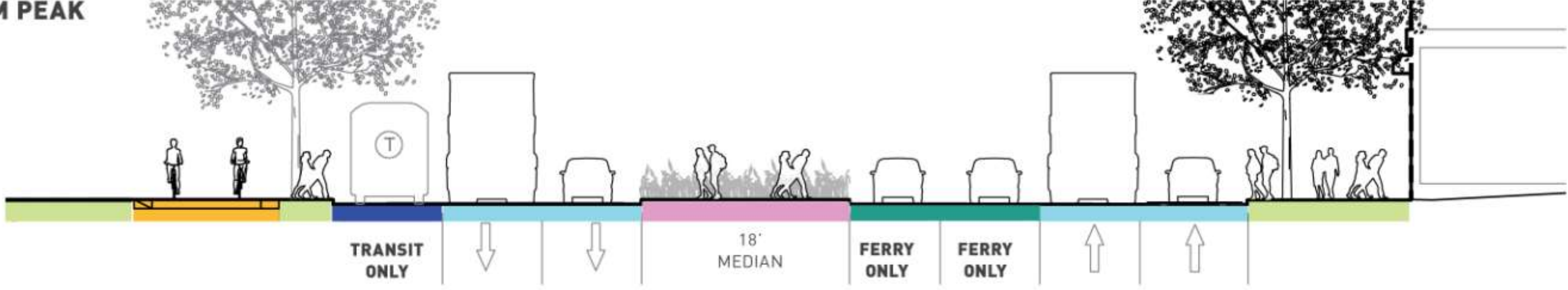
JULY, 2012

FLEX LANES

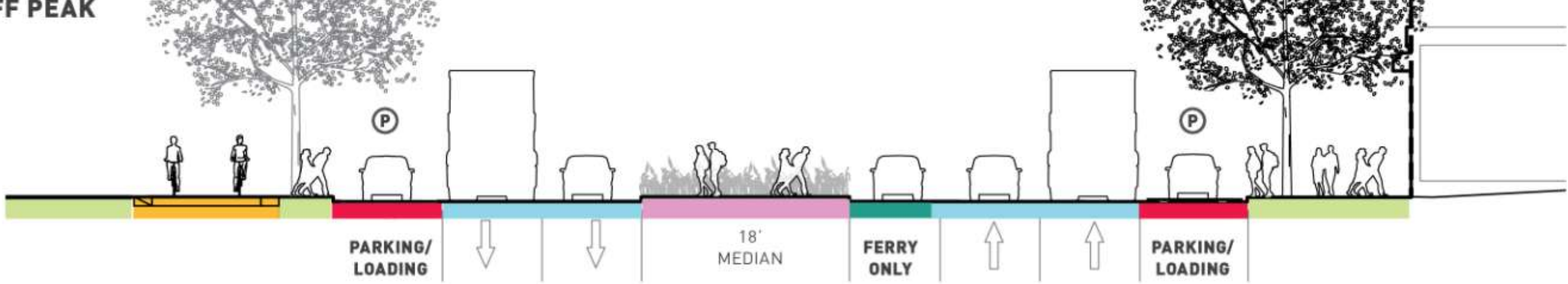
AM PEAK



PM PEAK



OFF PEAK



LOCAL WATERFRONT TRANSIT

WATERFRONT TRANSIT ACCESS

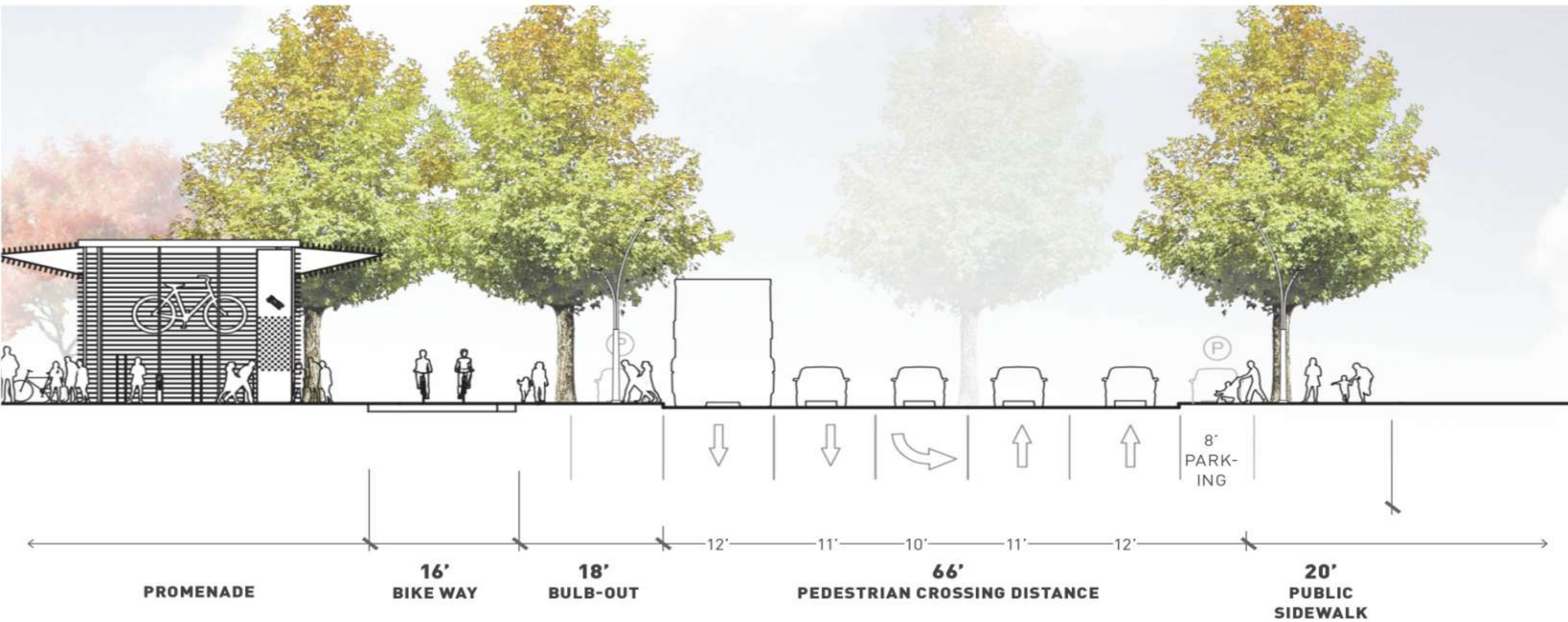
- LIGHT RAIL
- TRANSIT TUNNEL STATIONS
- BUS TRANSIT SPINE AND PATHWAYS
- MADISON STREET HCT CORRIDOR
- EXISTING AND PLANNED STREETCAR
- ALTERNATIVE CENTER CITY CONNECTOR CORRIDORS
- SW TRANSIT PATHWAY OPTIONS
- FREQUENT TROLLEY BUS ROUTES
- WATERFRONT CONNECTOR



WATERFRONT TRANSIT CONCEPT

- SERVES LOCAL WATERFRONT MARKET
- OPERATES IN STREET IN SHARED LANE
- FREQUENT
- USER FRIENDLY
- LEGIBLE
- ICONIC
- FITS WATERFRONT CHARACTER AND DEMAND
- COMPELLING ALTERNATIVE TO DRIVING
- COMPLIMENTARY TO OTHER DOWNTOWN TRANSIT

C: Alaskan Way at Spring Street



HISTORIC STREETCAR FEASIBILITY

- VEHICLE OPERATIONS/SAFETY
- GRADES
- DOORS ON BOTH SIDES
- AUTOMATIC DOORS/SINGLE OPERATOR
- DISABILITY ACCESS

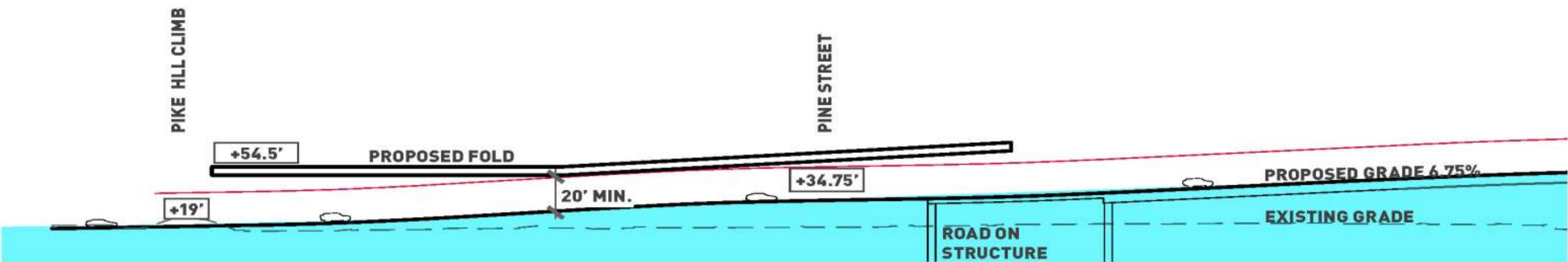
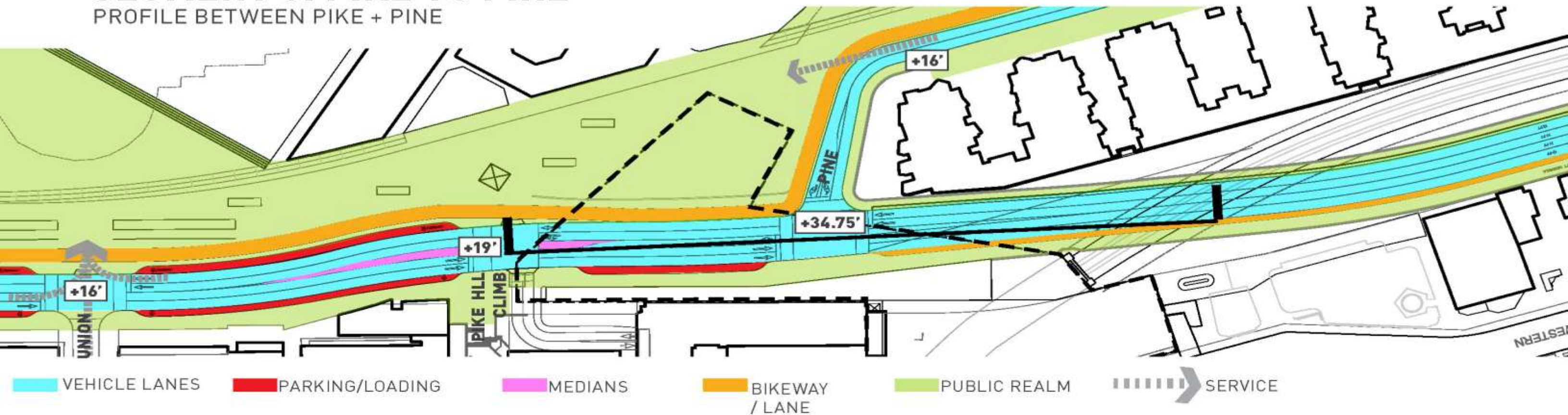
COMPATIBILITY WITH MODERN STREETCAR

- LOW FLOOR LOADING
- VOLTAGE

UTILITY CONFLICTS



SEGMENT 5: PIKE TO PINE
PROFILE BETWEEN PIKE + PINE



PROFILE BETWEEN PIKE AND STEWART ST., LOOKING WEST

VEHICLE IMPROVEMENTS

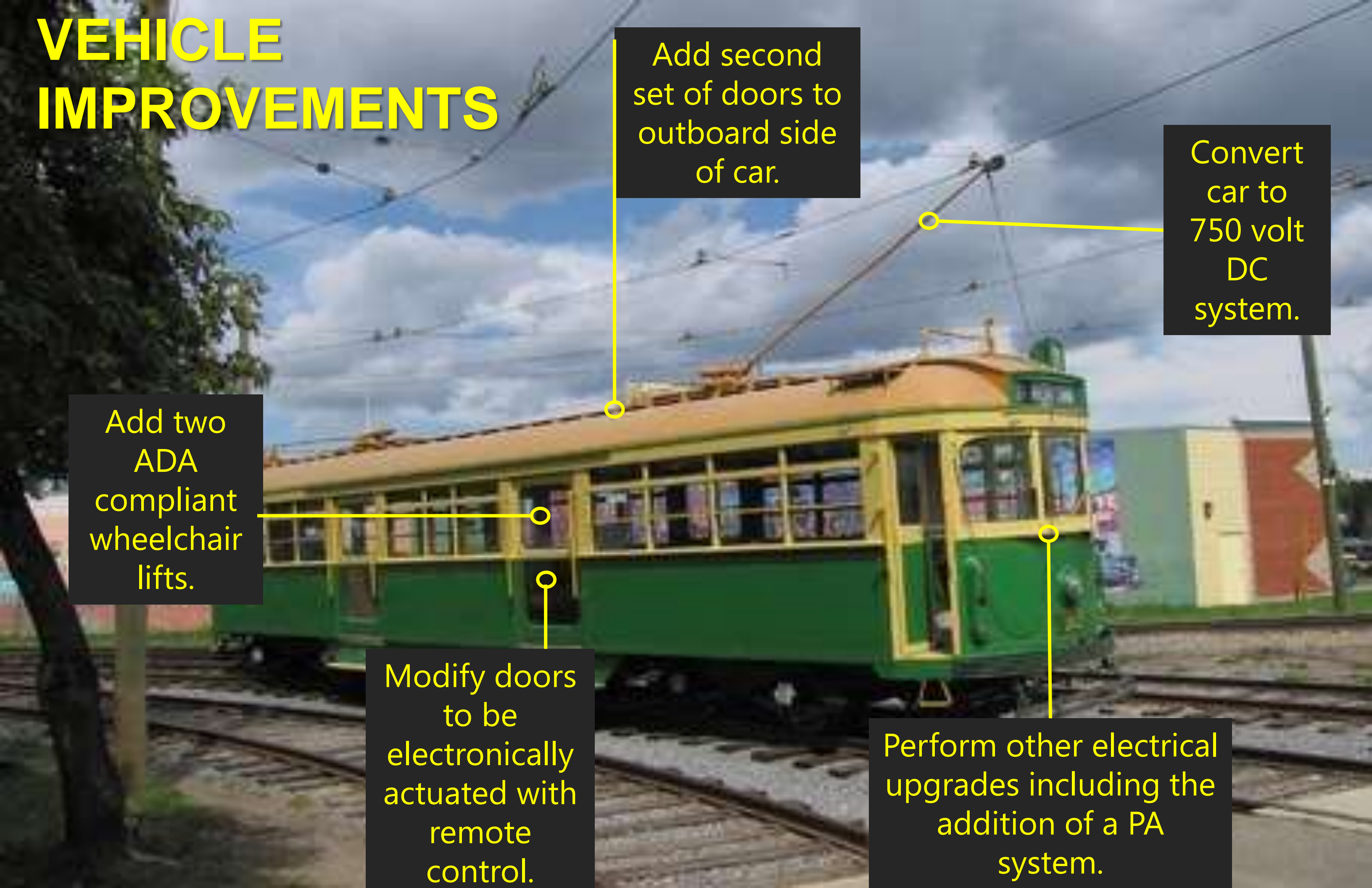
Add second
set of doors to
outboard side
of car.

Convert
car to
750 volt
DC
system.

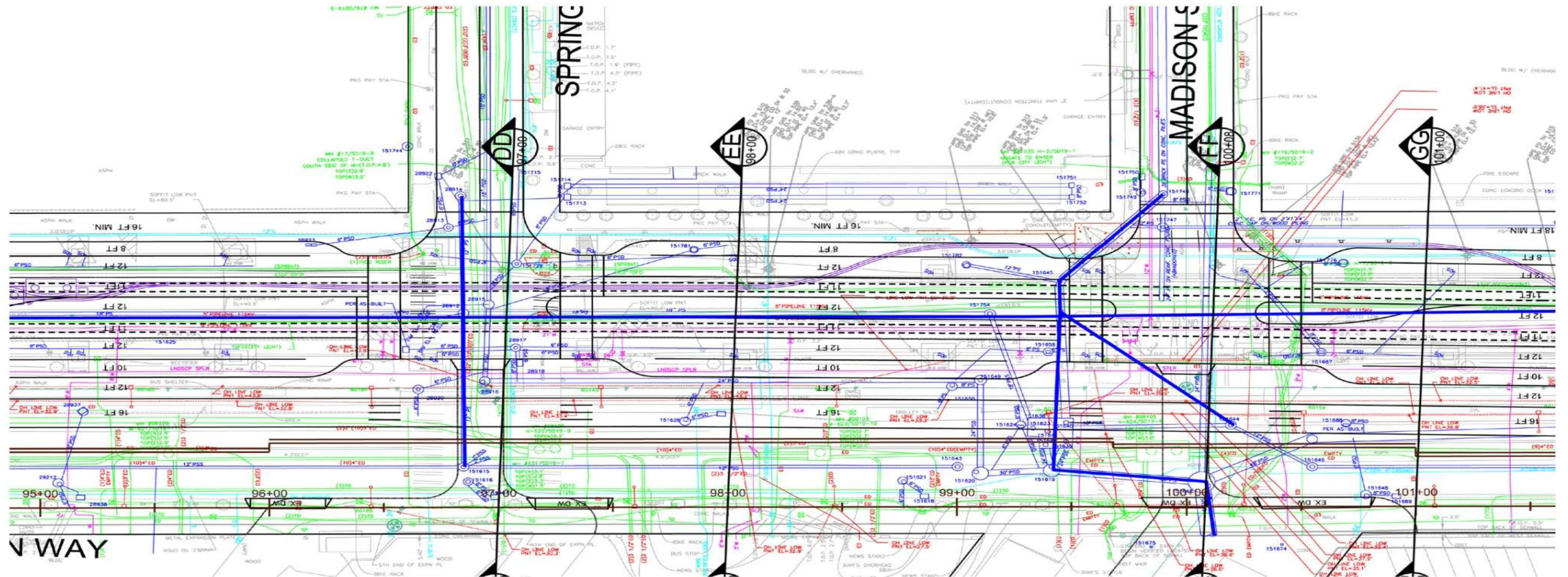
Add two
ADA
compliant
wheelchair
lifts.

Modify doors
to be
electronically
actuated with
remote
control.

Perform other electrical
upgrades including the
addition of a PA
system.



UTILITY CONFLICTS



LOCAL WATERFRONT TRANSIT EVALUATION



HISTORIC STREETCAR



RUBBER TIRE TRANSIT



MODERN STREETCAR



RUBBER TIRE TRANSIT

HEADWAYS: 15 MINUTES



MODERN STREETCAR ROUTE

CENTER LANES/MEDIAN PLATFORMS

HEADWAYS: 15 MINUTES

LEGEND

WATERFRONT STREETCAR ROUTE

STREETCAR STATION

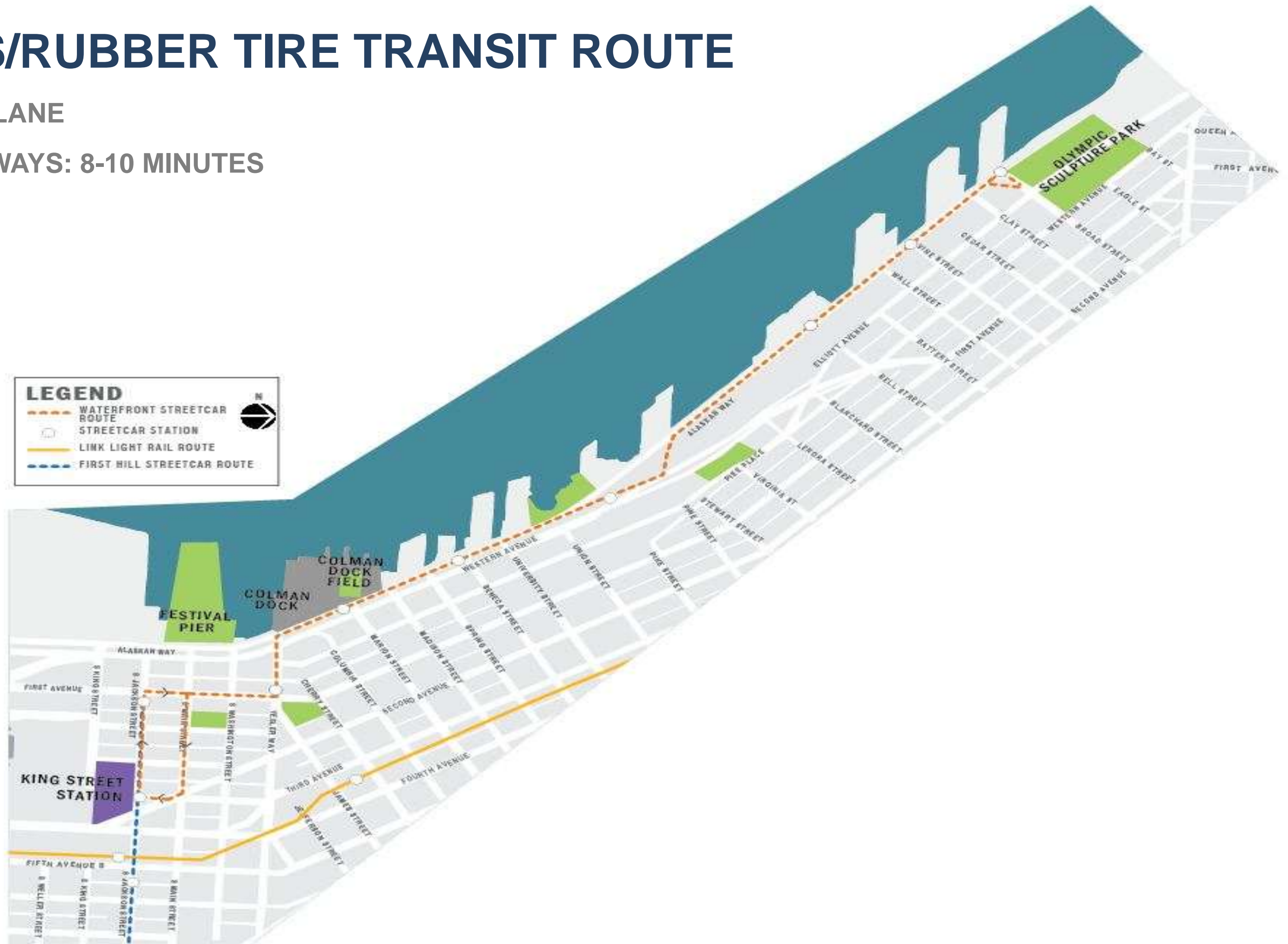
LINK LIGHT RAIL ROUTE

FIRST HILL STREETCAR ROUTE

N



HEADWAYS: 8-10 MINUTES



HISTORIC STREETCAR OPTIONS

TWO OPTIONS TO BE EVALUATED:

LOWER COST OPTION

- OPERATES SEPARATELY FROM MODERN STREETCAR SYSTEM
- HIGH FLOOR LOADING
- ONLY MODIFICATION IS TO ADD DOORS TO BOTH SIDES
- TROLLEY BARN UNDER ELLIOTT WAY AT PINE STREET
- VEHICLE IMPROVEMENT COST - \$1.4 MILLION

HIGHER COST OPTION

- CARS COMPATIBLE WITH MODERN STREETCAR SYSTEM** (LOW FLOOR LOADING, 750 V)
- AUTOMATIC DOORS – SINGLE OPERATOR
- WHEELCHAIR LIFTS
- VEHICLE IMPROVEMENT COST - \$14.6 MILLION

**EXCEPT FIRST HILL LINE

EVALUATION CRITERIA

COSTS

- Operations and Maintenance
- Capital (vehicles, power, rails, platforms, maintenance base)
- Utility conflicts requiring relocation

ENVIRONMENTAL

- Noise
- Air Quality
- Aesthetics

OPERATIONS & PERFORMANCE

- Vehicle/System Capacity
- Travel time
- Safety
- Rider Comfort/Satisfaction
- Vehicle Operations
- Traffic Impact
- ADA Compliance

FUNDING

- Public funding potential
- Private fundraising potential

DISCUSSION